



REVENUE VOLATILITY & REVENUE TREND REPORT

EXECUTIVE APPROPRIATIONS COMMITTEE
STAFF: THOMAS YOUNG, LFA

ISSUE BRIEF

SUMMARY

To manage long-term revenue fluctuations, avoid committing short-term gains to long-term obligations, and assure Utah has adequate and justifiable resources in reserve, the Utah Legislature has established two policies. The first requires the Office of the Legislative Fiscal Analyst (LFA) and Governor's Office of Management and Budget (GOMB) to report revenue volatility, recommend changes to rainy day fund (RDF) deposit amounts and transfer limits, present options for RDF deposit mechanisms linked to volatility, and recommend prospective RDF deposit mechanisms. The second requires LFA and GOMB to annually compare consensus revenue estimates to 15-year trends for each tax type. This report fulfills both of LFA's requirements for calendar year 2014.

Once every three years the Utah Legislature reviews the adequacy of Utah's rainy day funds. When Legislators last reviewed the funds in 2011, they increased automatic deposit thresholds from 6% to 8% for the General Fund Budget Reserve Account and 7% to 9% for the Education Budget Reserve. They did so to match reserve deposits with amounts of revenue at risk due to forecast error over about 18 months. Since 2011, anticipated General and Education Fund forecast errors have increased, as shown in Table 1. To cover the increased amount at risk for the same 18 month period, the Analyst recommends increasing rainy day fund transfer thresholds to 9% for the General Fund Budget Reserve Account and 11% for the Education Budget Reserve Account.

Table 1 - Downside Forecast Errors

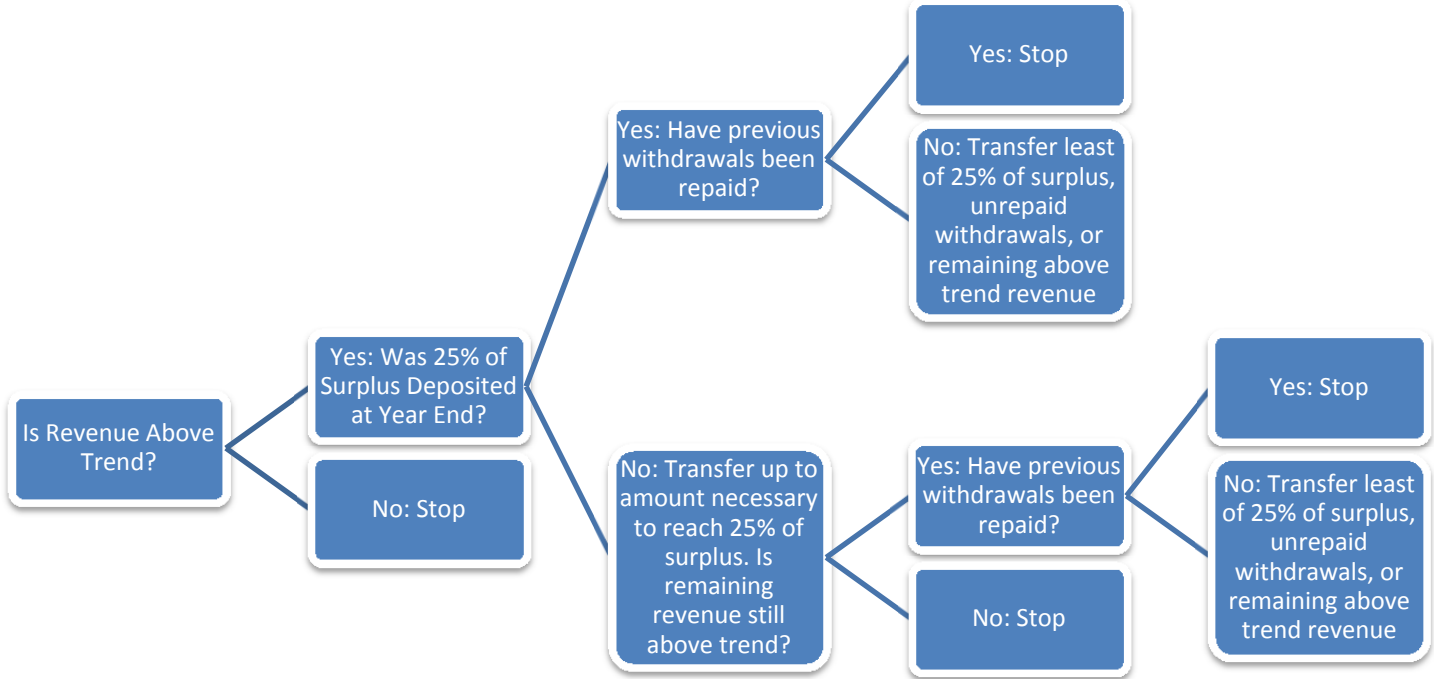
Time Horizon	GF Forecast Error	EF Forecast Error	FY 2015 GF Amount @ Risk (Millions)	FY 2015 EF Amount @ Risk (Millions)	Total FY 2015 @ Risk (Millions)	FY 2016 GF Amount @ Risk (Millions)	FY 2016 EF Amount @ Risk (Millions)	Total FY 2016 @ Risk (Millions)
Consensus Time Horizon (FY 2015 & FY 2016)								
6 Months	2.2%	2.6%	\$49	\$89	\$138			
18 Months	9%	11%				\$208	\$389	\$597

The abovementioned rainy day fund thresholds guide executive branch actions after a surplus has occurred. The thresholds do not limit the dollar amounts contained in rainy day funds. Legislators can, and have, proactively deposited amounts in the funds by appropriation. In FY 2008, General Rainy Day Fund balances exceeded existing thresholds by \$48 million. In FY 2009, Education Rainy Day Fund amounts were \$32 million above the transfer cap. The Legislature deposited additional revenue by appropriation based upon a "gut" feeling that revenue growth estimates were unsustainable. New requirements for 15-year revenue trend analysis and recommendations on forward-looking deposit rules provide a more methodical approach.

Our review of the 15-year revenue trends associated with major tax types finds that, of the \$5.8 billion FY 2016 revenue forecast, \$116 million is above trend. We also find that, at the end of fiscal year 2014, Utah's Education Fund Budget Reserve account hit the existing 9% transfer threshold before 25% of the FY 2014 Education Fund revenue surplus was deposited and with \$48 million in past withdrawals remaining unrepaid. The General Budget Reserve Account has \$85 million in past withdrawals unrepaid, even after 50% of the FY 2014 revenue surplus (after other deductions) was deposited.

We recommend that, when revenue estimates are above trend, legislators appropriate to a budget item the following amounts: a.) if 25% of the prior year's revenue surplus was not deposited due to the transfer limits, the amount necessary to reach 25%; and b.) if previous withdrawals remain unrepaid, an additional 25% of the prior-year's surplus, outstanding withdrawals, or remaining above trend revenue, whichever is less. The following decision tree details our recommended approach. If revenue collections meet or exceed estimates at year-end, appropriated amounts would be deposited into the rainy day funds.

Above Trend Rainy Day Fund Deposits Decision Tree



BACKGROUND

House Bills 49 of the 2008 General Session, codified in Utah Code Annotated 63J-1-205, requires, beginning in calendar year 2011, a triennial report regarding:

- The volatility of the tax bases and revenue streams that fund the State budget;
- Balances in the General Fund Budget Reserve Account and the Education Fund Budget Reserve Account; and
- The adequacy of the balances in the budget reserve accounts relative to the volatility of the revenue streams.

In 2011, policymakers determined that the Division of Finance should automatically transfer a portion of revenue surpluses into the Rainy Day Funds until the balances in the funds are sufficient to address revenue volatility and forecast error. At that time, policymakers determined that the automatic transfer threshold for the General Fund should be 8%, and the automatic transfer threshold for the Education Fund should be 9%.

House Bill 357 of the 2014 General Session (UCA 63J-1-205) further required that, beginning in calendar year 2014, the triennial report include options for deposit mechanisms based upon revenue volatility including:

- How those options would have performed historically;
- How those options will perform based upon current estimates; and
- Recommendations on forward-looking deposit rules based upon volatility.

House Bill 311 of the 2014 General Session (UCA 36-12-13 and 63J-1-201) requires an annual analysis of 15-year revenue trends. House Joint Resolution 11 of the 2014 General Session suggests legislators consider using above trend revenue for one time purposes.

This report responds to and makes recommendations based upon all of the above requirements.

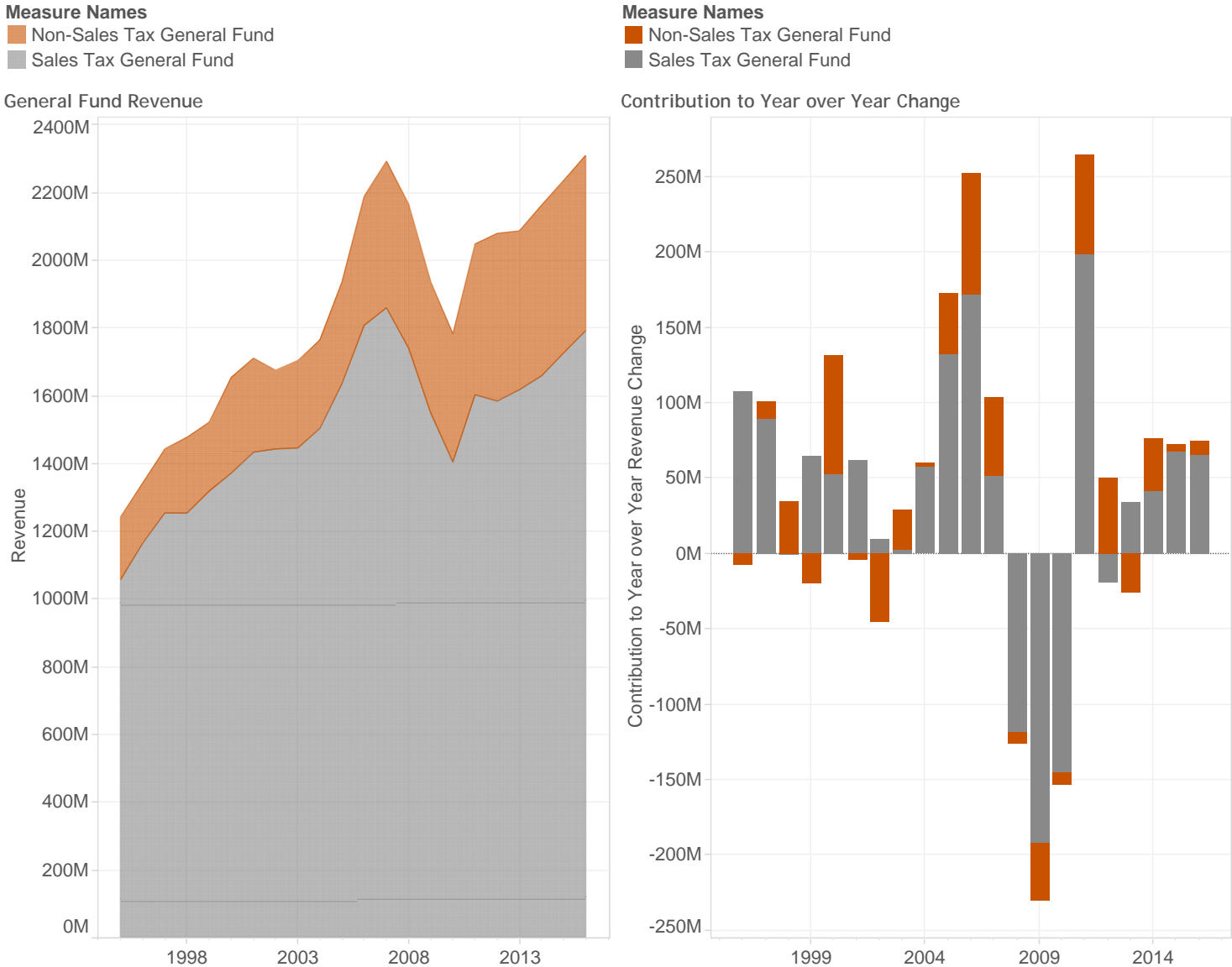
ANALYSIS ON VOLATILITY OF THE TAX BASES AND REVENUE STREAMS

This section addresses the volatility of the tax bases and revenue streams to the General Fund and Education Fund.

General Fund Volatility

General Fund revenue volatility is affected by such things as disposable income, retail sales, business investment, consumer sentiment, household net worth, credit markets, interest rates, shifts in taxpayer behavior, inflation, demand for insurance products, oil and natural gas production, metal prices, purchases of alcohol and tobacco products, professional fees, and changes to tax bases and rates. Although each of these factors matters, the factors that influence sales tax matter the most (left pane of Figure 1 below). Over the past five fiscal years, sources other than sales taxes have contributed from 5% to 28% to the percentage change in General Fund revenue (right pane of Figure 1 below).

Figure 1 - General Fund Revenue Streams and Contribution to Year-over-Year Change



General Fund Tax Base & Revenue Volatility

Revenue sources to the General Fund include sales tax (78%), beer, cigarette & tobacco taxes (5%), severance taxes (5%), insurance premium taxes (4%) and other taxes and transfers (8%). Of the categories mentioned, on a relative trend adjusted basis, the sources with the largest cyclical movements (greatest volatility) are, in descending order, the severance taxes, sales taxes, cigarette, & tobacco taxes, and insurance premiums (see Figure 2). Although economic factors are the largest contributors to the volatility shown in figures 2 and 3, they are not the only reason for the observed volatility. Policy changes also contribute to overall volatility, both on the upside and the downside. For instance, the cigarette and tobacco taxes show historical jumps and declines around time periods when the tax rate on packs of cigarettes were increased.

Has General Fund Volatility Increased?

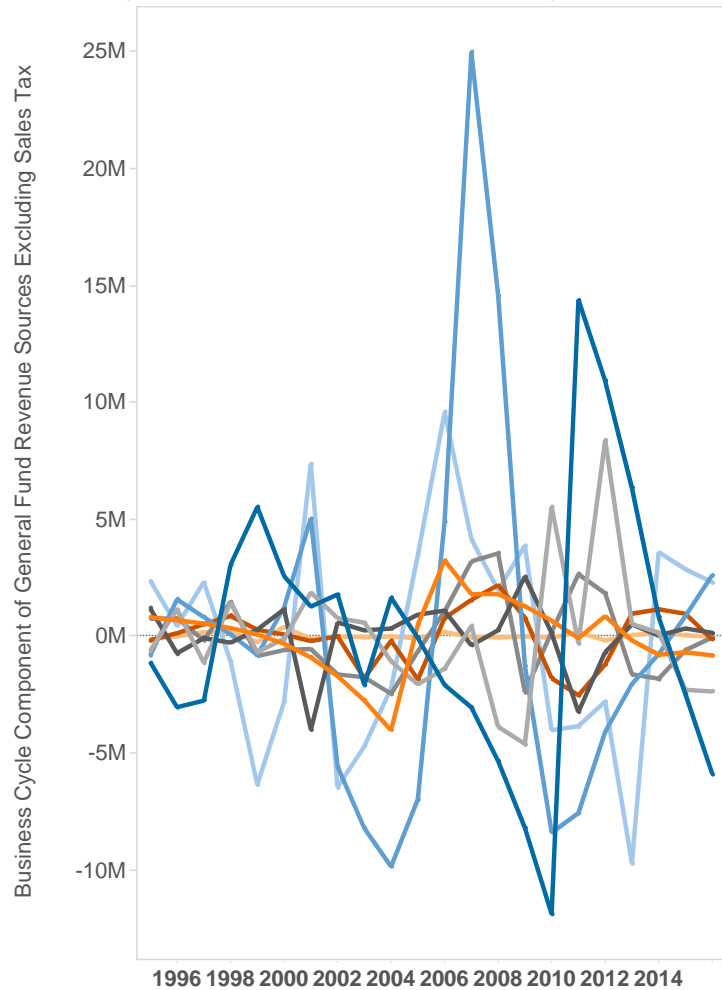
Volatility changes over time. As is shown in figures 2 and 3, volatility is increasing. The volatility increase is not just a deep recession phenomenon, but rather has historical precedent for lasting longer than just a couple of years.

Figure 2 - Volatility of Sources to the General Fund

Measure Names

- Beer Cigarette Tobacco Tax cycle
- Insurance Premium Tax Cycle
- Metal Severance Tax cycle
- Cable Tax Cycle
- Investment Income cycle
- Oil Gas Tax Cycle
- General Fund Other Cycle
- Liquor Profits Cycle
- Property Energy Credit Cycle

Inflation-Adjusted General Fund Revenue Sources' Cycles



Inflation-Adjusted Sales Tax Cycle

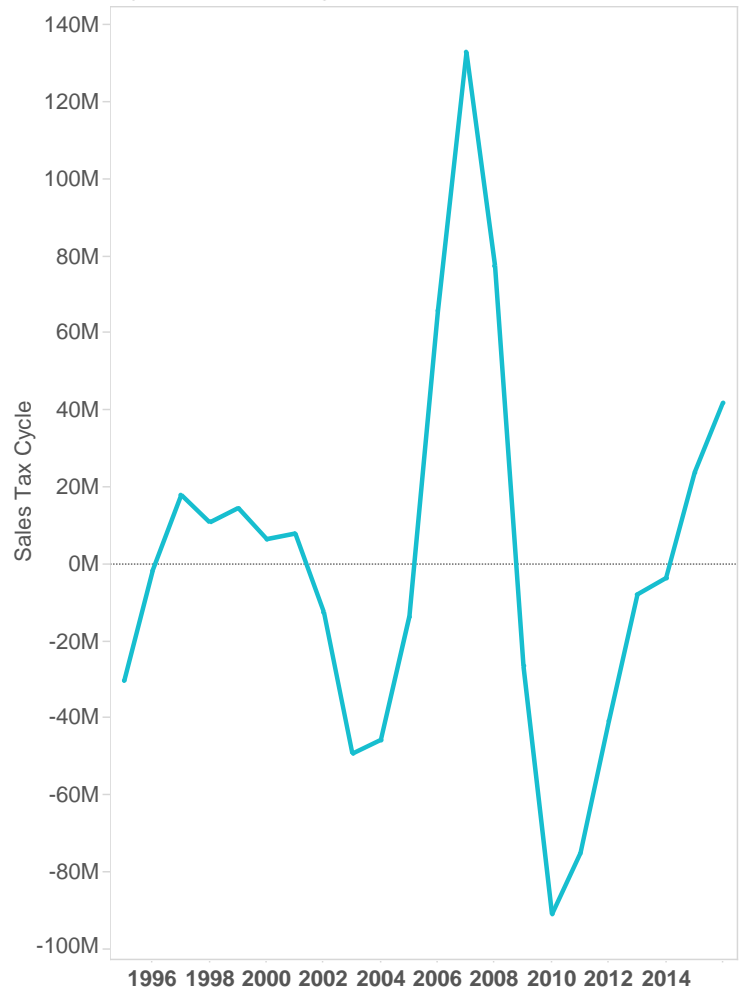
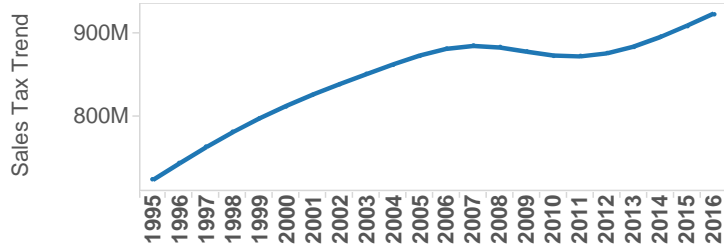
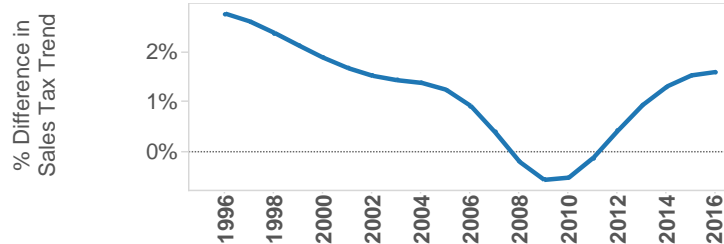


Figure 3 - Trend and Year-over-Year Change in Trend of Selected General Fund Revenue Sources (Inflation-Adjusted)

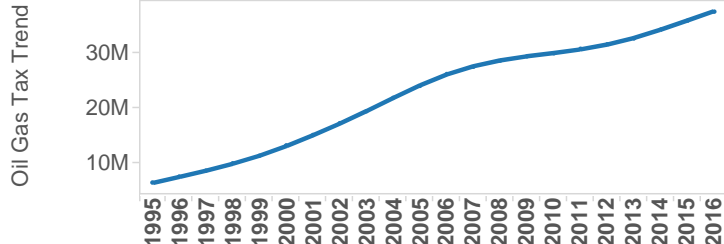
Inflation-Adjusted Sales Tax Trend



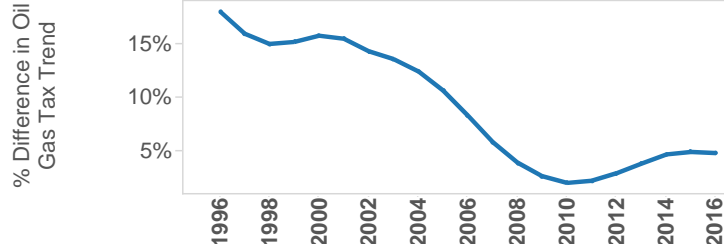
Y/Y % Change in Inflation-Adjusted Sales Tax Trend



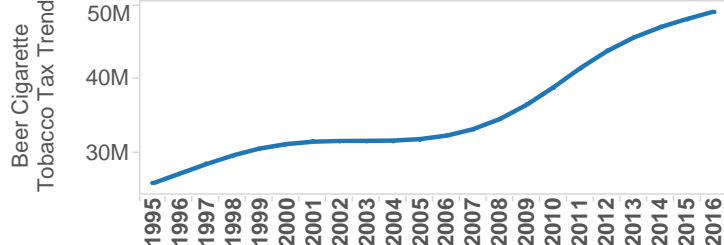
Inflation-Adjusted Oil and Gas Severance Tax Trend



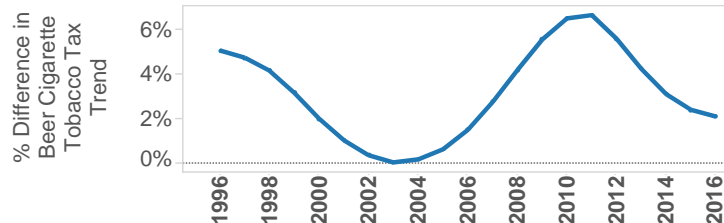
Y/Y % Change in Inflation-Adjusted Oil and Gas Tax Trend



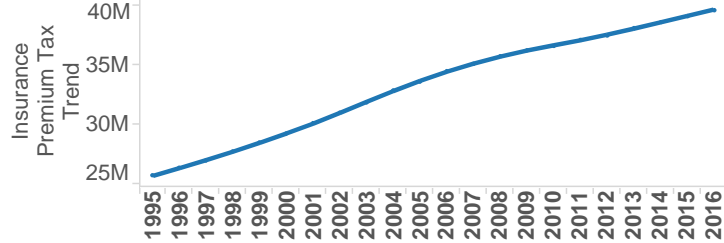
Inflation-Adjusted Beer, Cigarette, and Tobacco Trend



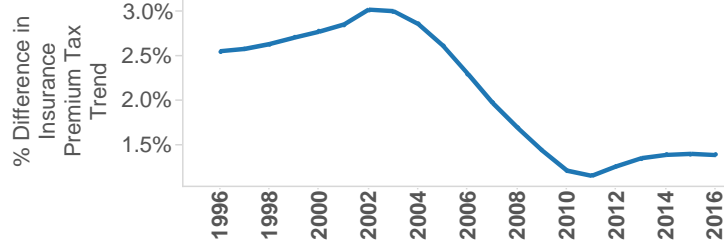
Y/Y % Change in Inflation-Adjusted Beer, Cigarette, and Tobacco Tax Trend



Inflation-Adjusted Insurance Premium Tax Trend



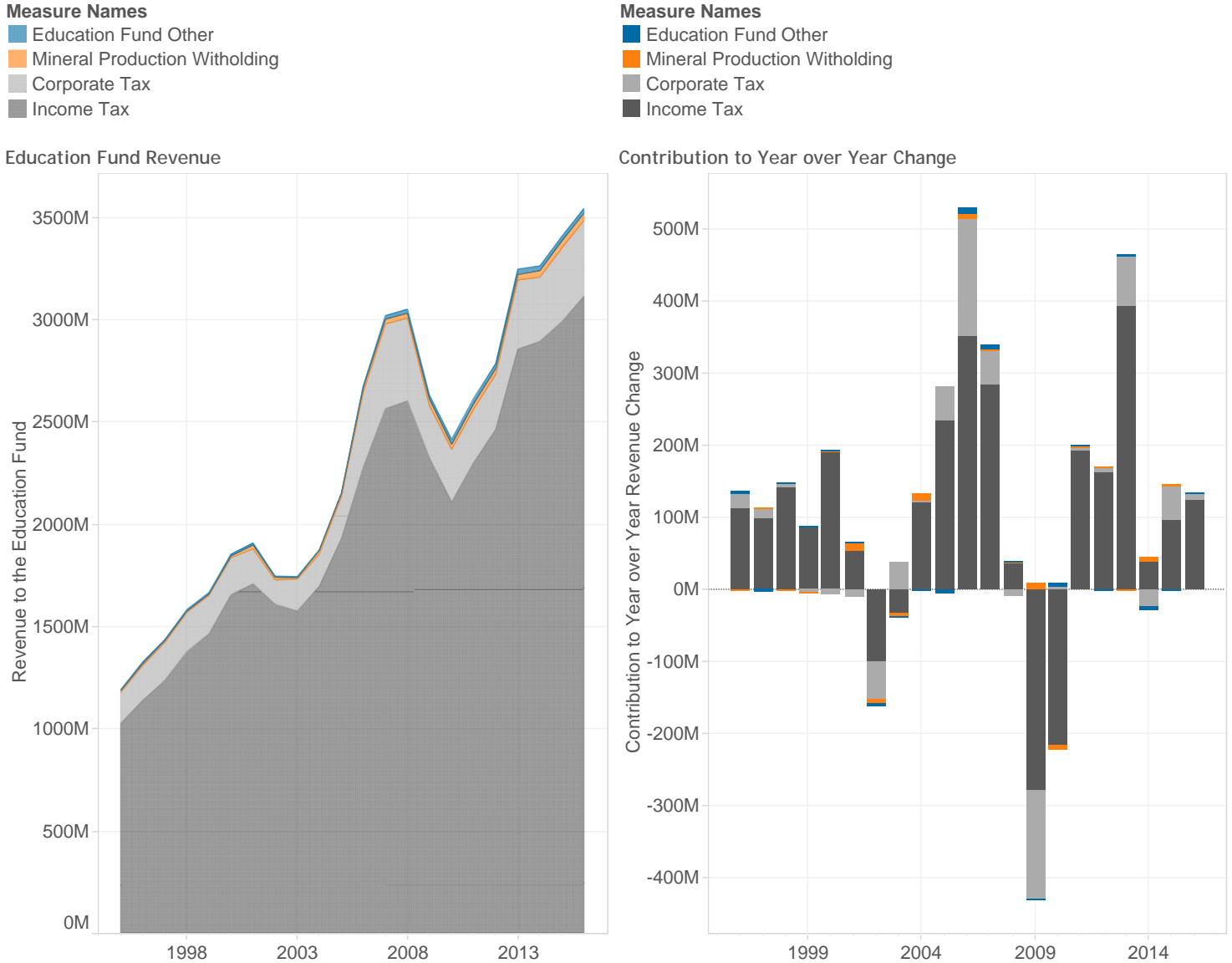
Y/Y % Change in Inflation-Adjusted Insurance Premium Tax Trend



Education Fund Volatility

Education Fund revenue volatility is affected by such things as withholding growth or decline, taxable corporate profits sourced to the State, capital gains, dividend income, interest income, business income, and changes to tax bases and rates. Although each of these factors matters, the factors that influence income tax matter the most (left pane of Figure 4 below). Over the past five fiscal years, sources other than income tax have contributed from -21% to 34% to the percentage change in Education Fund revenue (right pane of Figure 4 below).

Figure 4 - Education Fund Revenue Streams and Contribution to Year-over-Year Change



Education Fund Tax Base & Revenue Volatility

Revenue sources to the Education Fund include income tax (88%), corporate tax (10%), and other sources (2%). The largest source of volatility is the bases upon which the various taxes are imposed. The individual income tax rate is imposed upon taxable income, which includes income from wages, salaries, dividends, interest, capital gains, alimony, businesses, IRAs, pensions, annuities, and various other sources of income. Income tax is also volatile because of credits and deduction. The second largest base to the Education Fund, corporate taxable income, is volatile because of changes in, among other things, gross receipts or sales, cost of goods sold, dividends, tax credits and deductions, labor costs, carryforward losses, and apportionment. In comparing the two largest sources of Education Fund revenue, corporate income tax is more volatile by around 30% (depends upon the measure used).

Although economic factors are the largest contributors to the volatility shown in figures 5 and 6, they are not the only reason for the observed volatility. Policy changes also contribute to the overall volatility, both on the upside and the downside. For instance, the income tax rate increase in 1965 increased the upside volatility of the income tax in FY 1966 (in FY 1967 this gets built into the trend component of revenue).

Has Education Fund Volatility Increased?

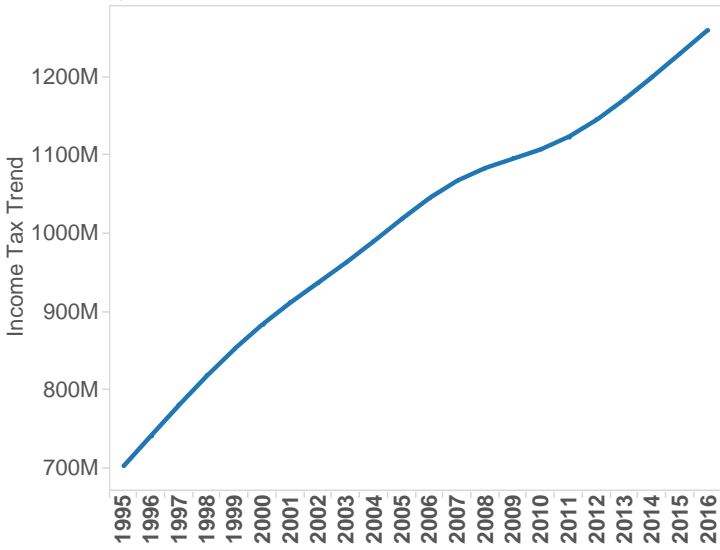
Volatility changes over time. As is shown in figures 5 and 6, volatility is increasing.

Figure 5 – Volatility of Sources to the Education Fund

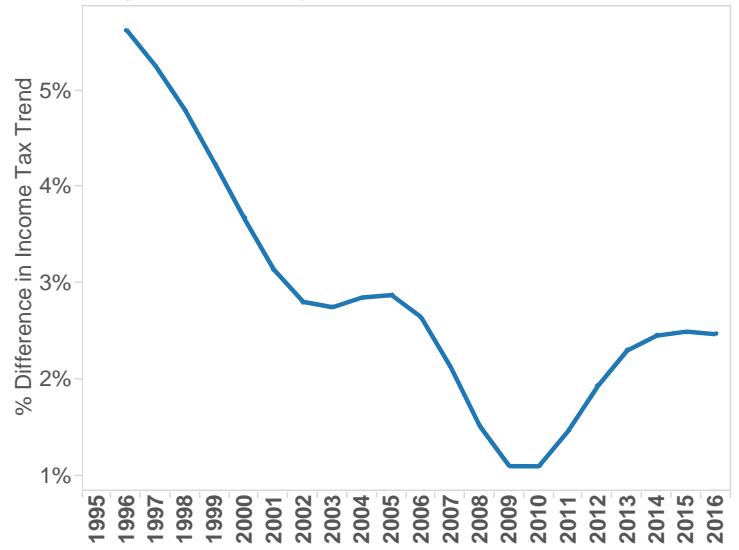


Figure 6 - Education Fund Trend and Year over Year Change in Trend (Inflation-Adjusted)

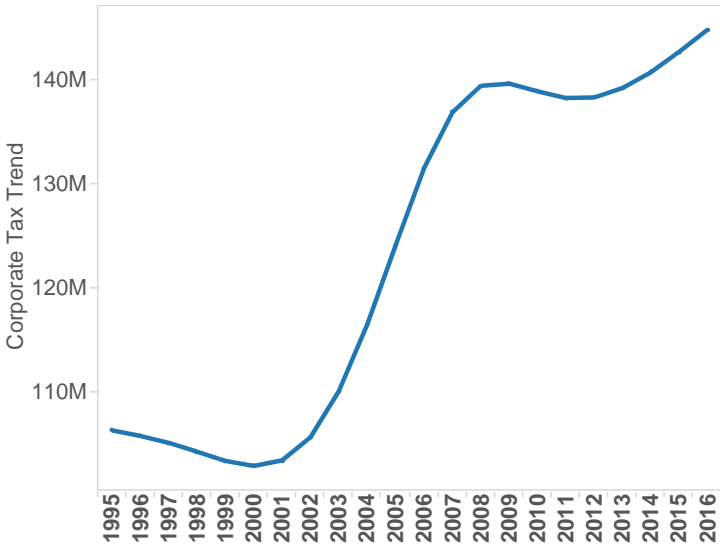
Inflation-Adjusted Income Tax Trend



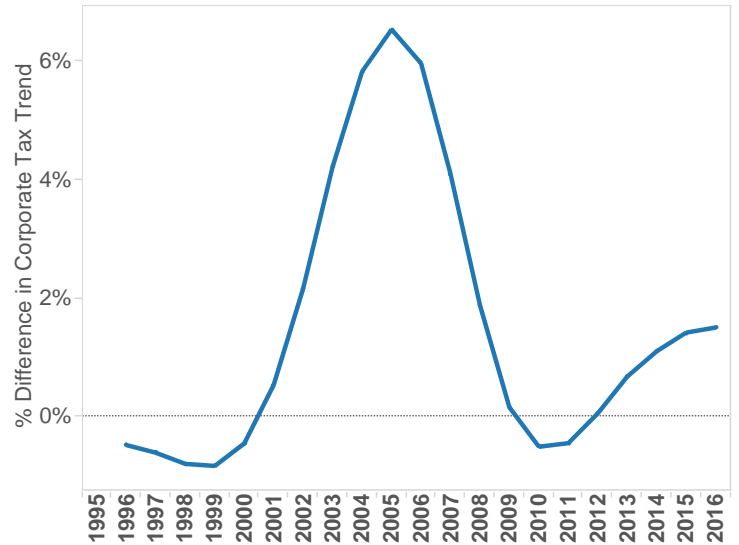
Y/Y % Change in Inflation-Adjusted Income Tax Trend



Inflation-Adjusted Corporate Tax Trend



Y/Y % Change in Inflation-Adjusted Corporate Tax Trend

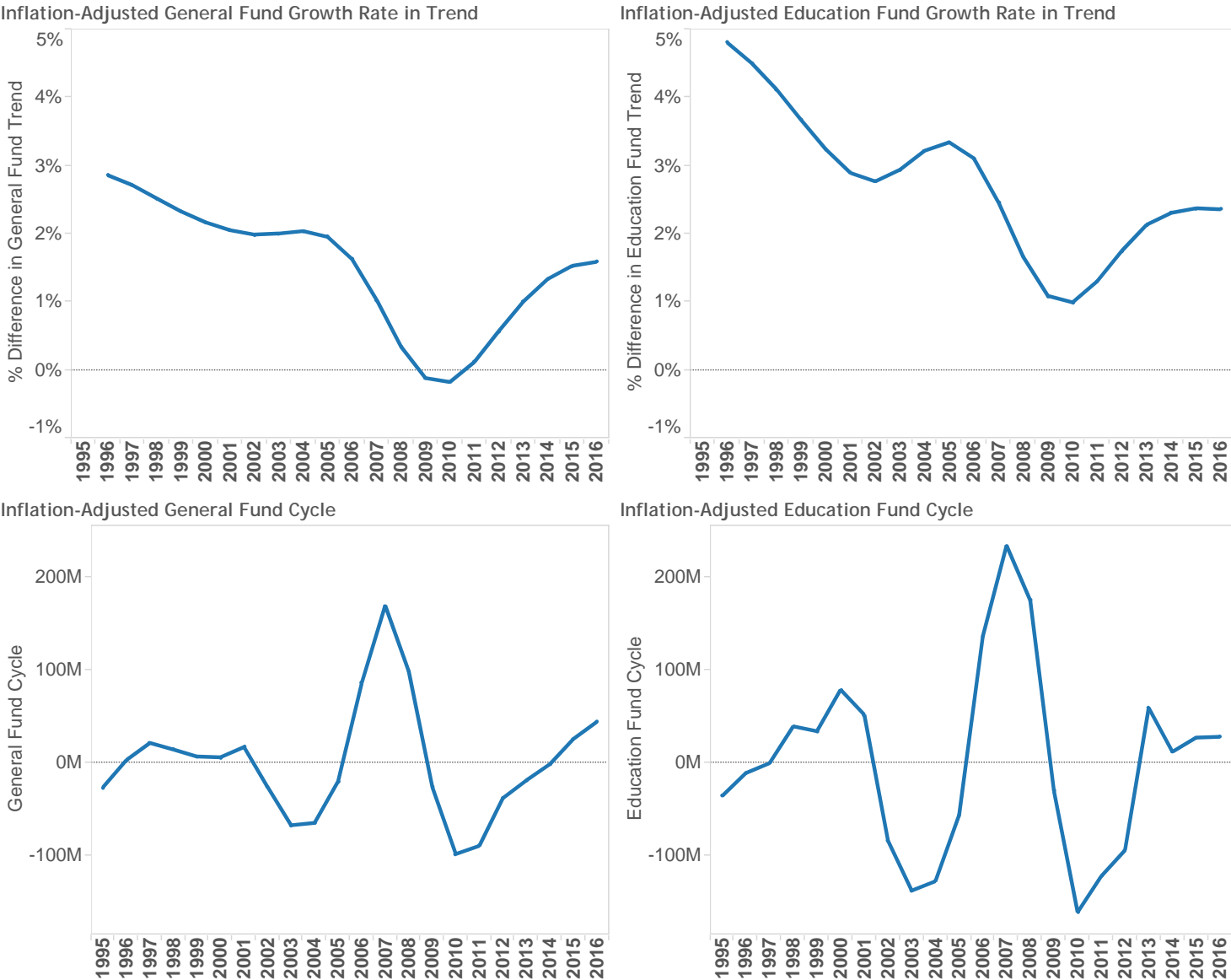


Which is More Volatile: General Fund or Education Fund?

Having presented the volatility of the tax bases and revenue sources of the General Fund and Education separately, this section compares the volatility of the two against each other.

A comparison of the cyclical and trend components of the revenue sources to the General and Education funds suggests that the Education Fund is more volatile by up to 2 times (standard deviation/coefficient of variation of the cyclical or trend components of revenue). Among other factors, this may be generally due to the fact that individuals' and corporations' income is less stable than individuals' and businesses' spending patterns (individuals and business tend to smooth spending rather than spend in spurts). The revenue recession of FY 2009 and FY 2010 continued the trend of greater volatility of Education Fund revenue over General Fund revenue, with the magnitude of the volatility difference being about a third. Figure 7 below represents a real dollar comparison of the volatility in Education Fund and General Fund revenue. The top pane shows the decline in the trend growth rate over time and the bottom pane represents the change in the cyclical portion of revenue. As shown, the Education Fund cycle is greater in magnitude than the General Fund is.

Figure 7 - General Fund and Education Fund Volatility



BALANCES OF THE BUDGET RESERVE ACCOUNTS

General Fund

At the end of FY 2014, the balance in the General Fund Budget Reserve Account (GFBRA) is \$141 million. This represents an increase of \$7 million over FY 2013. As a percent of FY 2011 appropriations, the GFBRA is at 6.5% of FY 2014 appropriations, about 1.5% away from its 8.0% cap. Should FY 2015 revenue come in above target, the amount that could be transferred to the GFBRA in FY 2015 is limited to 8.0% of FY 2015 appropriations, which, as of writing, would limit the automatic transfer in FY 2015 to \$46 million.

Education Fund

Ending FY 2014 with \$290 million, the Education Fund Budget Reserve Account (EFBRA) amounts to 9.0% of total FY 2014 appropriations. Should FY 2015 revenue come in above target, the amount that could be transferred to the EFBRA in FY 2015 is limited to 9.0% of FY 2015 appropriations, which, as of writing, would limit the automatic transfer in FY 2015 to \$16 million.

Figure 8 - Rainy Day Fund Balances

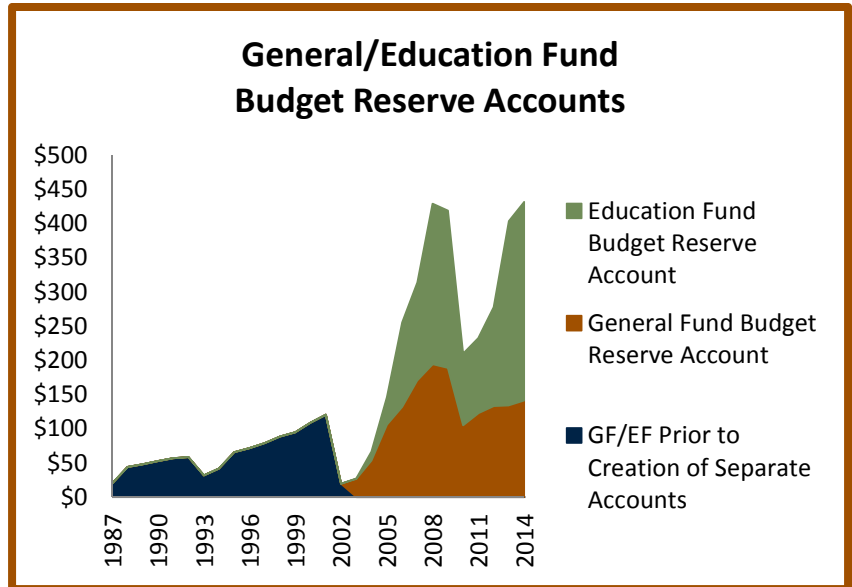


Figure 9 - Fund Balances & Share of Appropriations

Reserves and Share of Appropriations				
Fiscal Year	General Fund (millions)	Pctg. of Appropriations	Education Fund (millions)	Pctg. of Appropriations
2003	\$27	1.4%	\$1	0.0%
2004	\$54	3.1%	\$13	0.7%
2005	\$106	5.6%	\$41	1.9%
2006	\$132	6.5%	\$123	5.6%
2007	\$171	8.9%	\$143	5.1%
2008	\$194	8.0%	\$235	6.7%
2009	\$189	8.6%	\$230	8.2%
2010	\$105	5.7%	\$105	4.0%
2011	\$123	5.9%	\$110	4.1%
2012	\$133	6.3%	\$144	5.3%
2013	\$134	6.6%	\$269	8.7%
2014	\$141	6.5%	\$290	9.0%

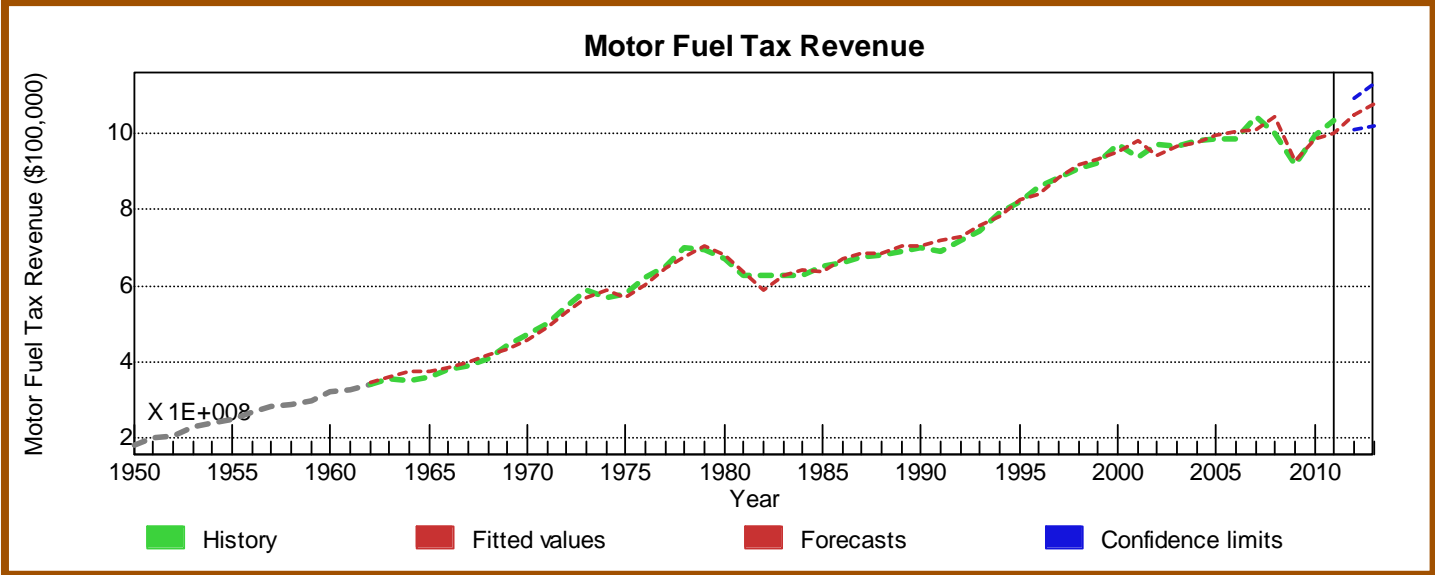
Table 2 - Recent Rainy Day Fund Balances

	General Fund Rainy Day	Education Fund Rainy Day	Total Rainy Day
Current Transfer Cap (FY 2014)	\$173,996,000 (8%)	\$290,454,112 (9%)	\$464,450,360
Current Balance	\$141,171,000	\$290,454,000	\$431,630,000
Difference	\$32,825,000	\$0	\$32,825,000

ADEQUACY OF THE BUDGET RESERVE ACCOUNT BALANCES

In order to cover unexpected declines in revenue, the adequacy of the GFBRA and the EFBRA depends upon the accuracy of the revenue forecasters and the economic indicators. When a forecast is performed, confidence limits are produced regarding the likely range a given revenue source make end up being. The forecast error increases as the time period of the forecast increases. For example, in looking at the forecast for motor fuel tax (Figure 10), the confidence limits (blue lines) are smaller in the initial years, and then widens into the future.

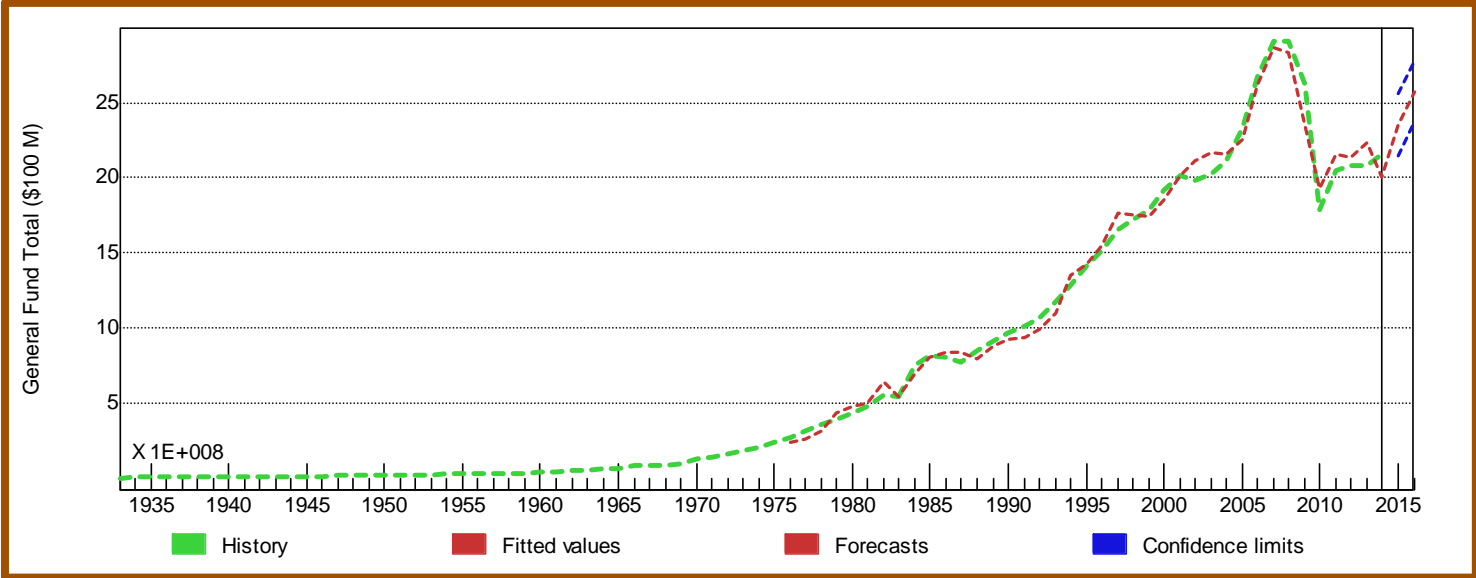
Figure 10 - Forecast Errors Associated with a Revenue Forecast



General Fund

The current cap for the General Fund is 8%. In reviewing the probability of a recession, current economic indicators, confidence intervals, and historical and recent volatility, the current 8% cap would cover about 89% of any anticipated revenue forecast error. Assuming current indicators are correct, in order to cover the anticipated forecast error, the cap would need to be 9%. The confidence interval (range) is shown by the blue lines in Figure 11.

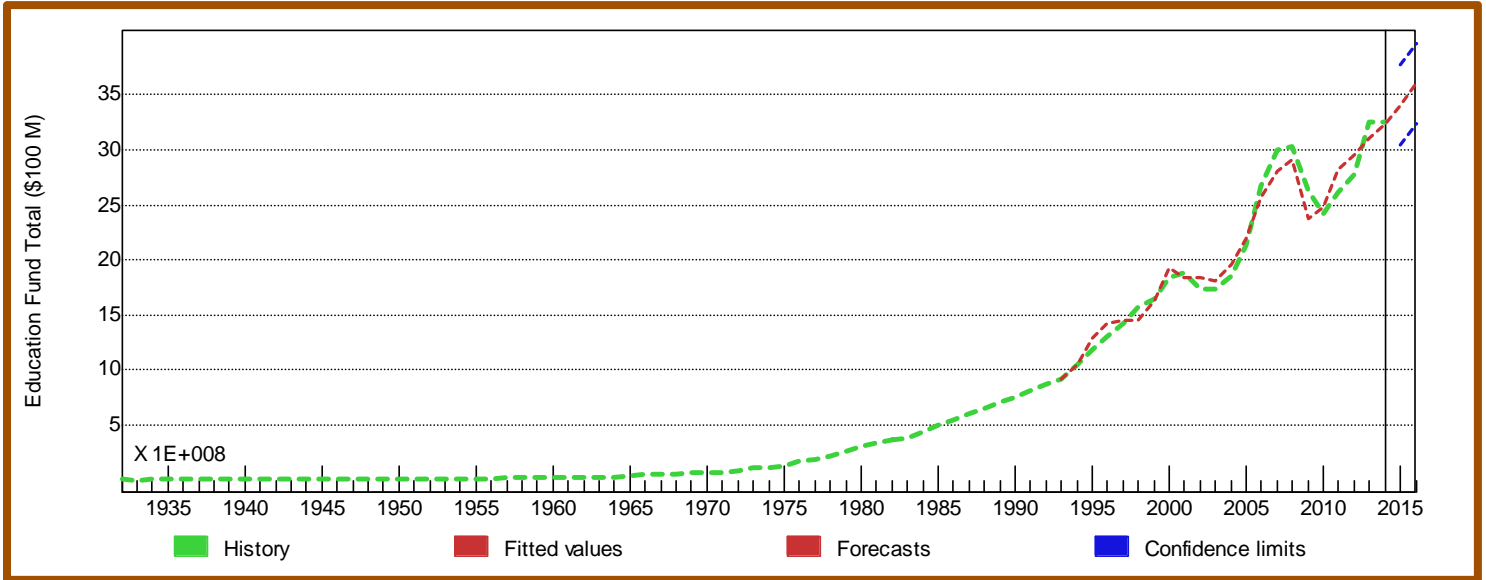
Figure 11 - General Fund Revenue Forecast Range



Education Fund

The current cap for the Education Fund is 9%. In reviewing the probability of a recession, current economic indicators, confidence intervals, and historical and recent volatility, the current 9% cap would cover about 82% of any anticipated revenue forecast error. Assuming current indicators are correct, in order to cover the anticipated forecast error, the cap would need to be 11%. The confidence interval (range) is shown by the blue lines in Figure 12.

Figure 12 - Education Fund Revenue Forecast Range



Recommendation: The Analyst recommends adjusting the General Fund and Education Fund budget reserve account automatic transfer caps to 9% and 11% in order to cover the amount at risk in the current 18-month revenue forecast.

15-YEAR REVENUE TRENDS

Statute requires an annual look at the 15-year revenue trends by major tax type. The following figures contain the actual or projected revenue by revenue type, the associated trend, and the cycle component of the projected revenue. The cycle (bottom bar graphs) is the difference between the point estimate and the trend component of that point estimate. As shown in Table 2, we estimate FY 2015 revenue estimates to be \$58 million above trend, and FY 2016 projections to be \$116 million above trend.

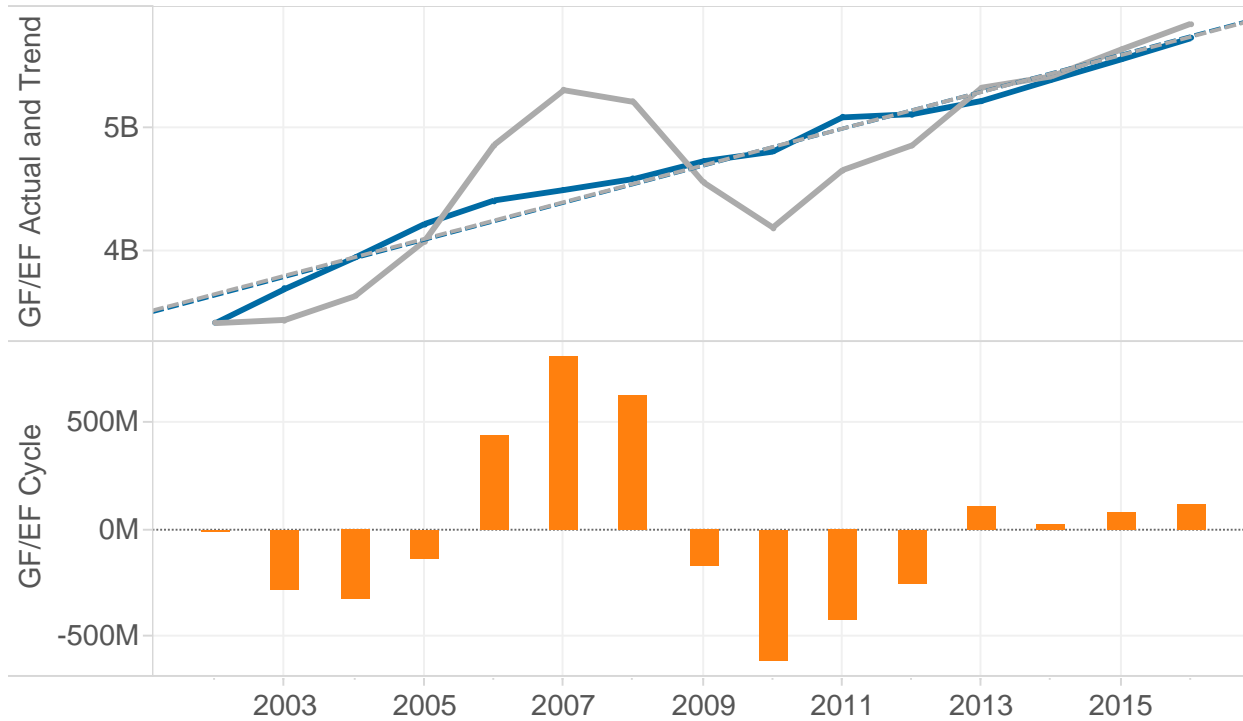
Table 2 – Business Cycle Component of the Revenue Forecast

	Business Cycle Components			
	FY 15 Trend	FY 15 Cycle	FY 16 Trend	FY 16 Cycle
General Fund (GF)				
Sales and Use Tax	1,712,525	12,261	1,722,744	67,685
Cable/Satellite Excise Tax	27,415	(976)	27,681	(1,265)
Liquor Profits	90,737	2,208	96,482	27
Insurance Premiums	93,603	509	96,328	111
Beer, Cigarette, and Tobacco	114,996	(6,004)	118,699	(13,854)
Oil and Gas Severance Tax	85,690	6,556	90,907	5,561
Metal Severance Tax	19,334	(1,379)	18,640	(55)
Inheritance Tax	0	0	0	0
Investment Income	3,545	1,556	146	5,472
Other	82,907	(5,525)	84,499	(5,592)
Property and Energy Credit	(6,292)	93	(6,288)	(46)
Subtotal General Fund	2,224,460	9,299	2,249,838	58,044
Education Fund (EF)				
Individual Income Tax	2,953,768	32,434	3,067,601	42,392
Corporate Tax	342,836	17,581	352,351	17,738
Mineral Production Withholding	33,457	1,307	34,936	711
Escheats & Other	25,429	(2,792)	25,625	(2,396)
Subtotal Education Fund	3,355,490	48,530	3,480,513	58,445
Total GF/EF	5,579,950	57,829	5,730,351	116,489

Figure 13 shows trends, cycle, and actual collections for General and Education Fund collections combined. The gray portion of the top graphic represents the actual General Fund/Education Fund experience. The top blue line represents the trend component of the revenue. The dotted linear represents the linear component of the trend. The orange bars in the bottom figure represent the business cycle component of General Fund/Education Fund revenue. One can see our \$116 million FY 2016 above trend revenue estimate from both the gap between the solid blue and solid gray line and the size of the orange bar.

Figure 13 – GF/EF Business Cycle

GF/EF Business Cycle



Note: dotted line represents the linear trend.

Measure Names

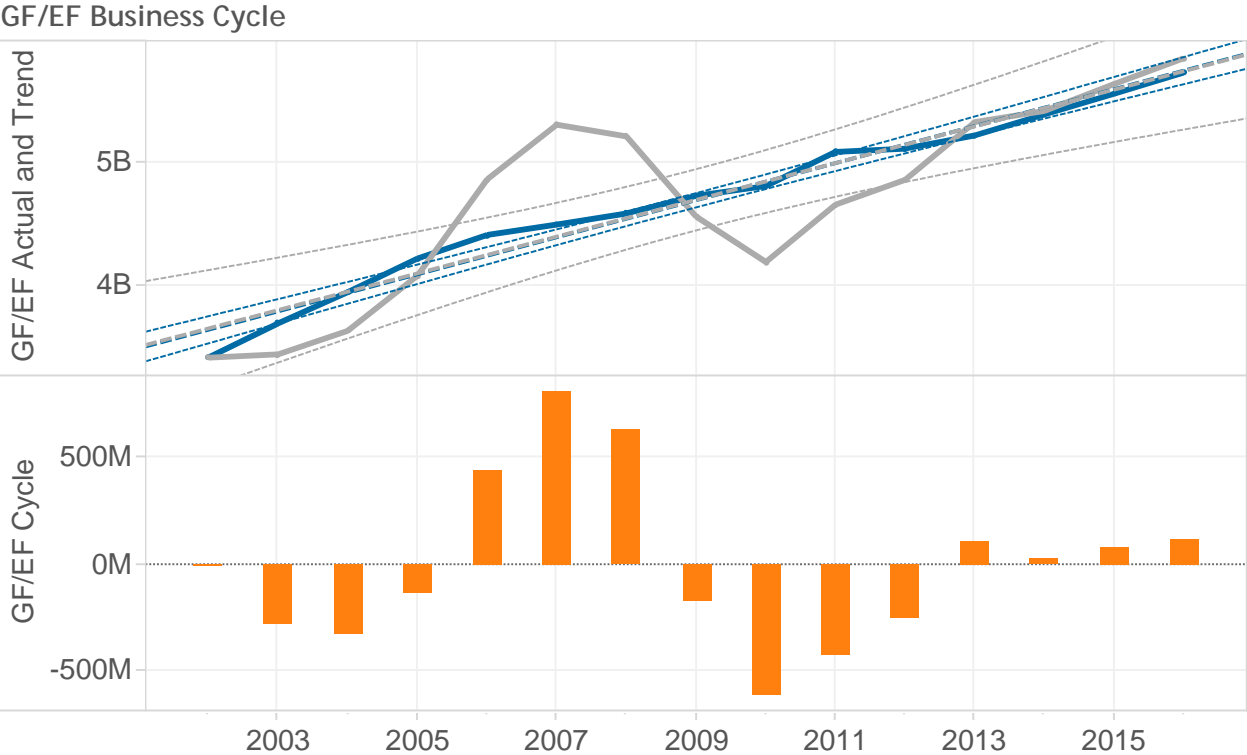
- GF/EF
- GF/EF Trend
- GF/EF Cycle

By their very nature, revenue estimates have built-in uncertainty. We've mentioned the forecast error associated with actual collections. Similarly, trend estimates contain error. To start with, the methodology behind trend estimation has high and low points. Additionally, different trend estimating methodologies adjust for policy and tax rate or base changes in different ways. Both point estimates and trends really fall within a range.

One way to communicate the uncertainty is to impose confidence bands around both the trend and the actual collections. Figure 14 does just that. The narrower, dotted light blue bands are for the trend component of General Fund/Education Fund revenue. The wider, dotted light gray bands represent the confidence bands around actual General Fund/Education Fund revenue.

Comparing Utah's current General and Education fund point estimate to the low end of the trend confidence interval, \$241 million would be above trend. Comparing the point estimate to the high end of the trend confidence interval, \$9 million would be below trend.

Figure 14 – General Fund/Education Fund Business Cycle Confidence Bands



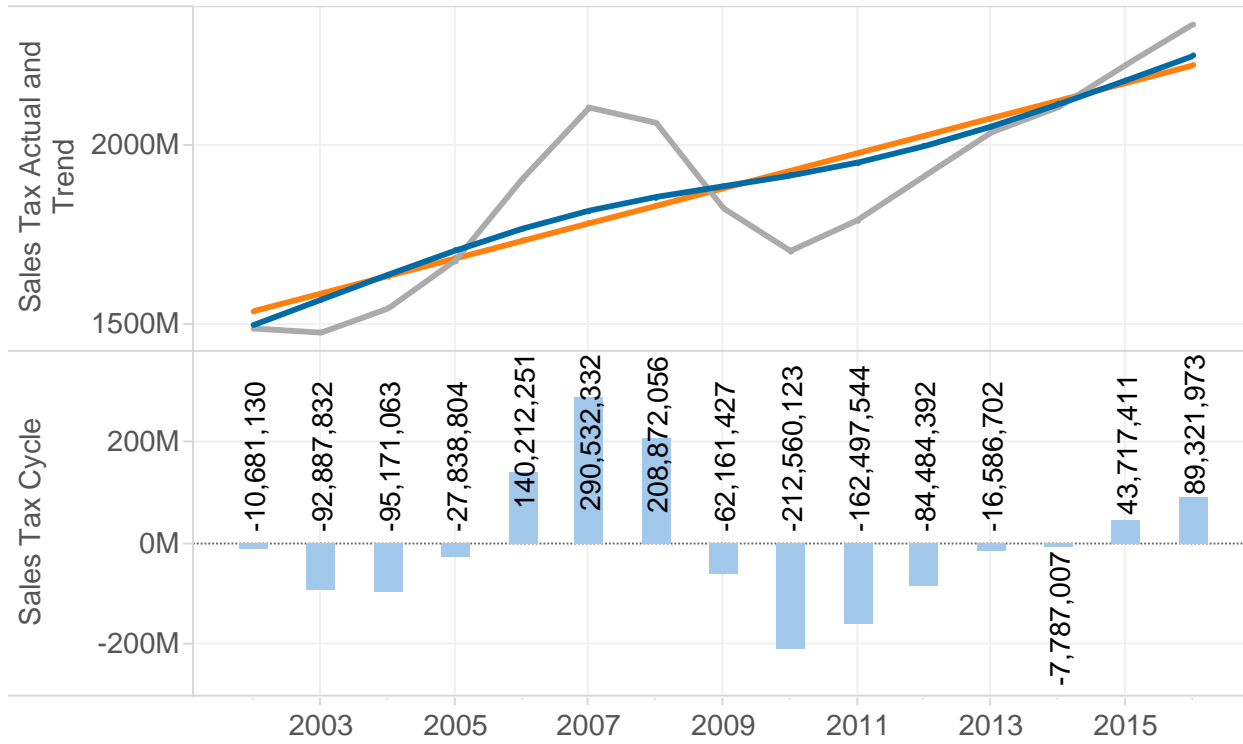
Note: in the figure are two confidence bands.

- Measure Names**
- GF/EF
 - GF/EF Trend
 - GF/EF Cycle

In the graphics that follow, we examine the trends, cycle, and actual collection for each major tax type going to Utah's General and Education Funds.

Figure 15 - Sales Tax Trend

Sales Tax, GF+Earmarks

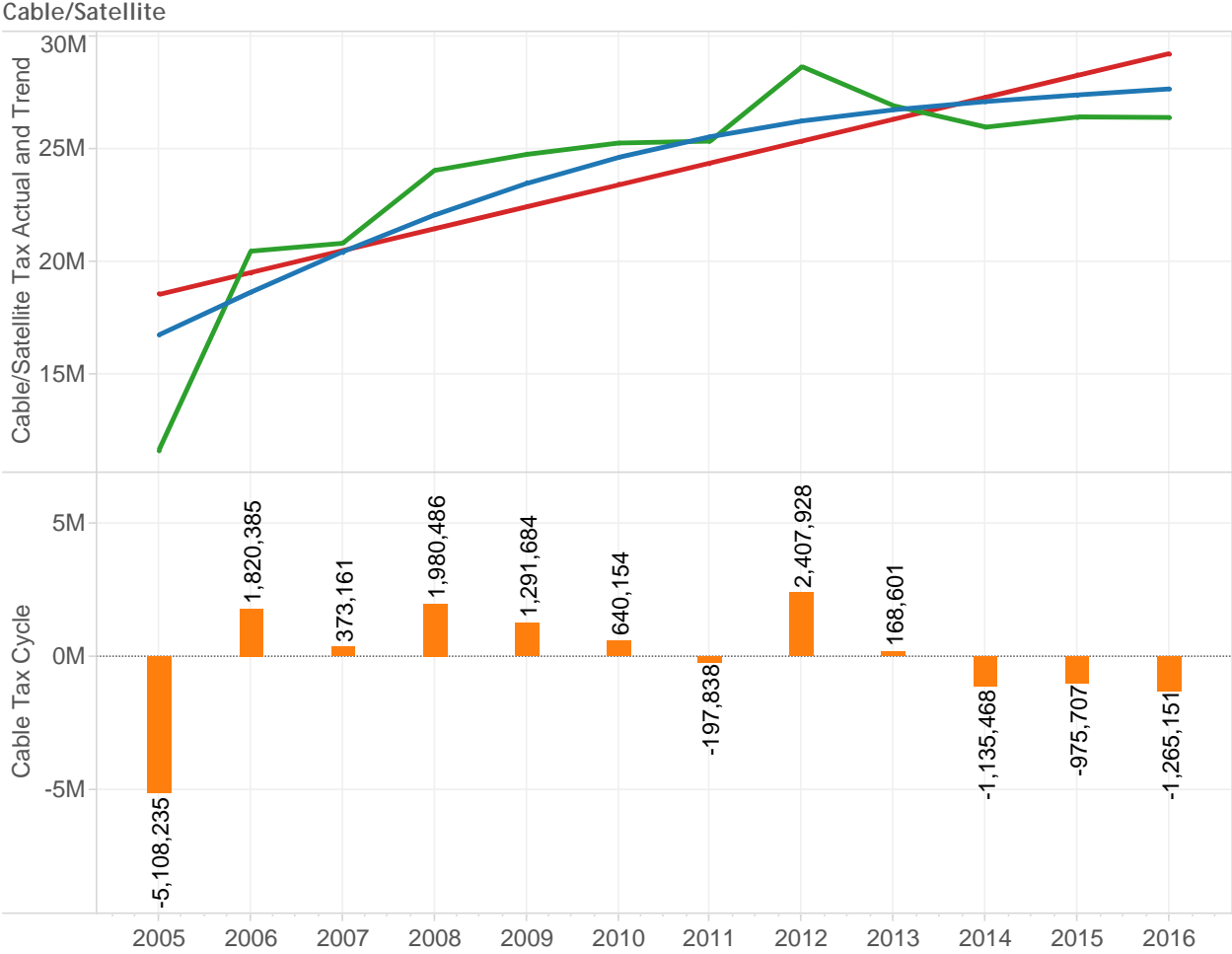


Note: The sales tax cycle includes GF and Earmarks.

Measure Names

- Sales Tax Trend
- Sales Tax Total
- Sales Tax Linear Trend
- Sales Tax Cycle

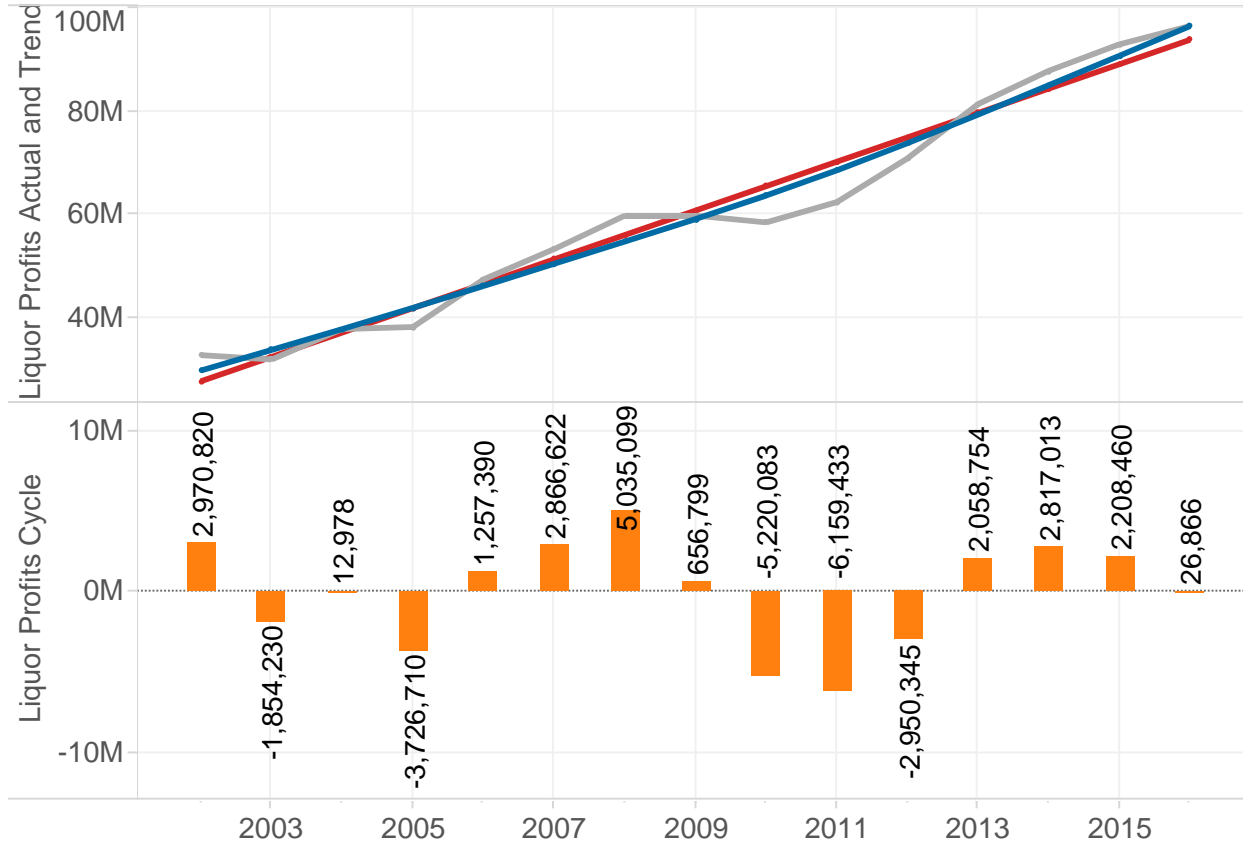
Figure 16 - Cable Tax Trend



- Measure Names**
- Cable Tax Trend
 - Cable Tax Cycle
 - Cable Satellite Excise Tax
 - Cable Tax Linear Trend

Figure 17 - Liquor Profits Trend

Liquor Profits

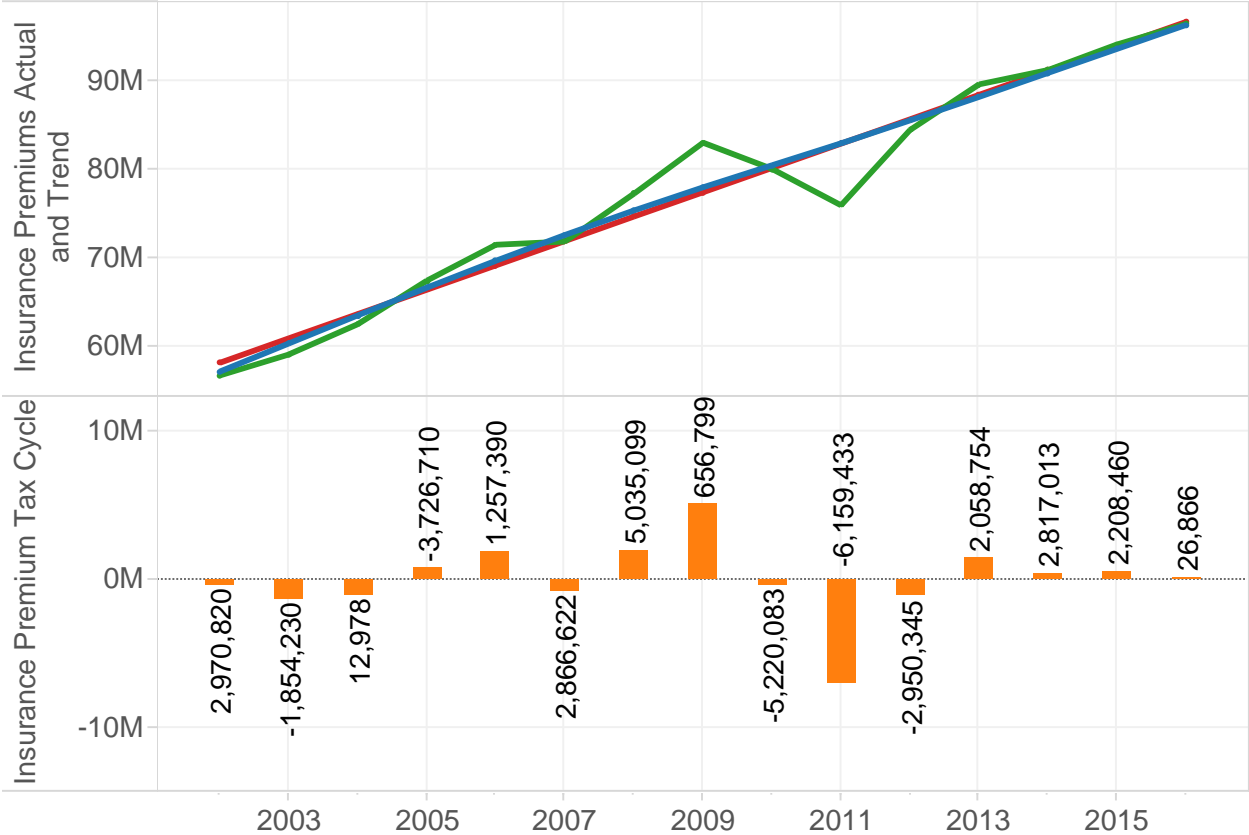


Measure Names

- Liquor Profits Trend
- Liquor Profits Cycle
- Liquor Profits
- Liquor Profits Linear Trend

Figure 18 - Insurance Premiums Trend

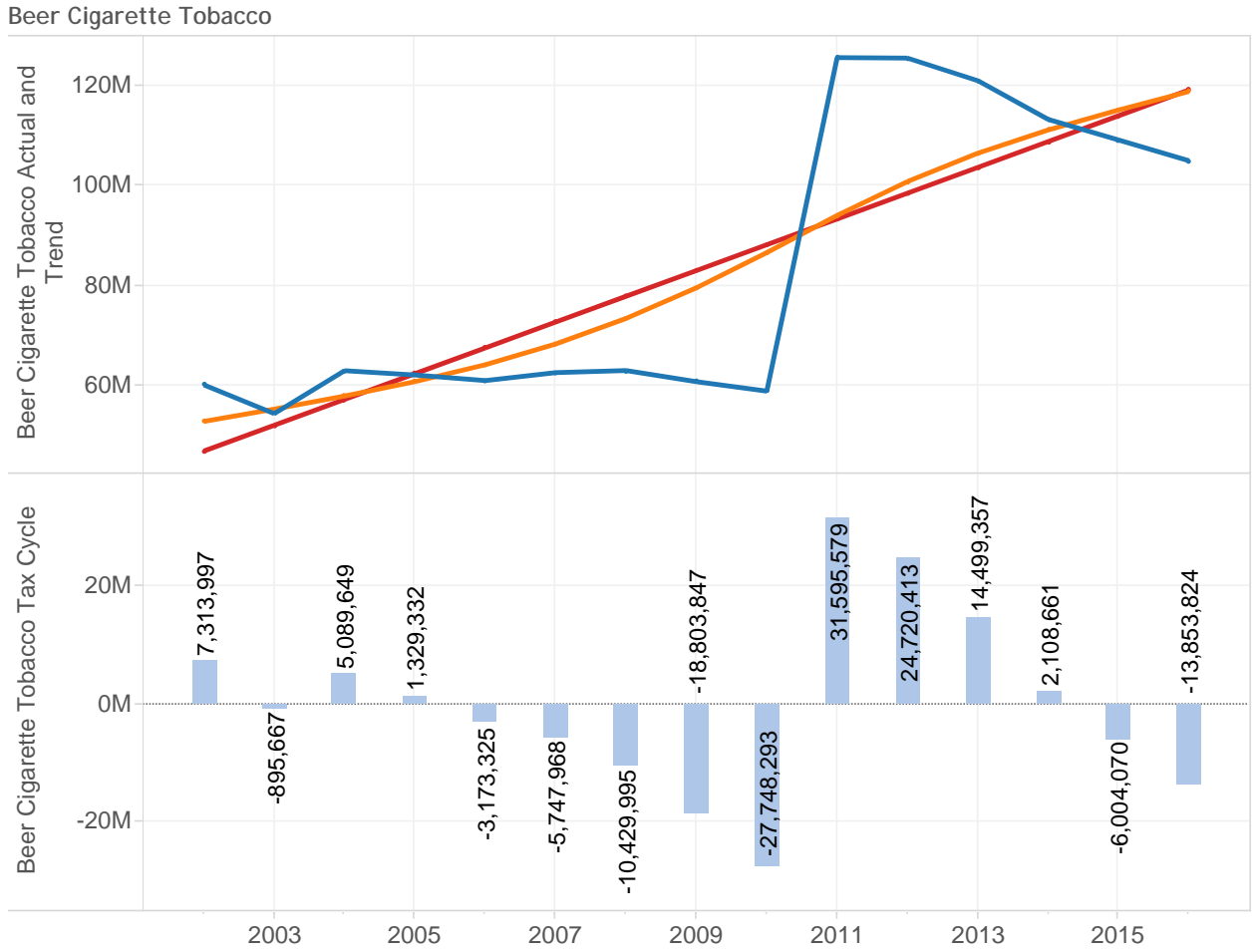
Insurance Premiums



Measure Names

- Insurance Premium Tax Trend
- Insurance Premium Tax Cycle
- Insurance Premium Tax
- Insurance Premium Tax Linear Trend

Figure 19 – Beer, Cigarette, and Tobacco Tax Trend

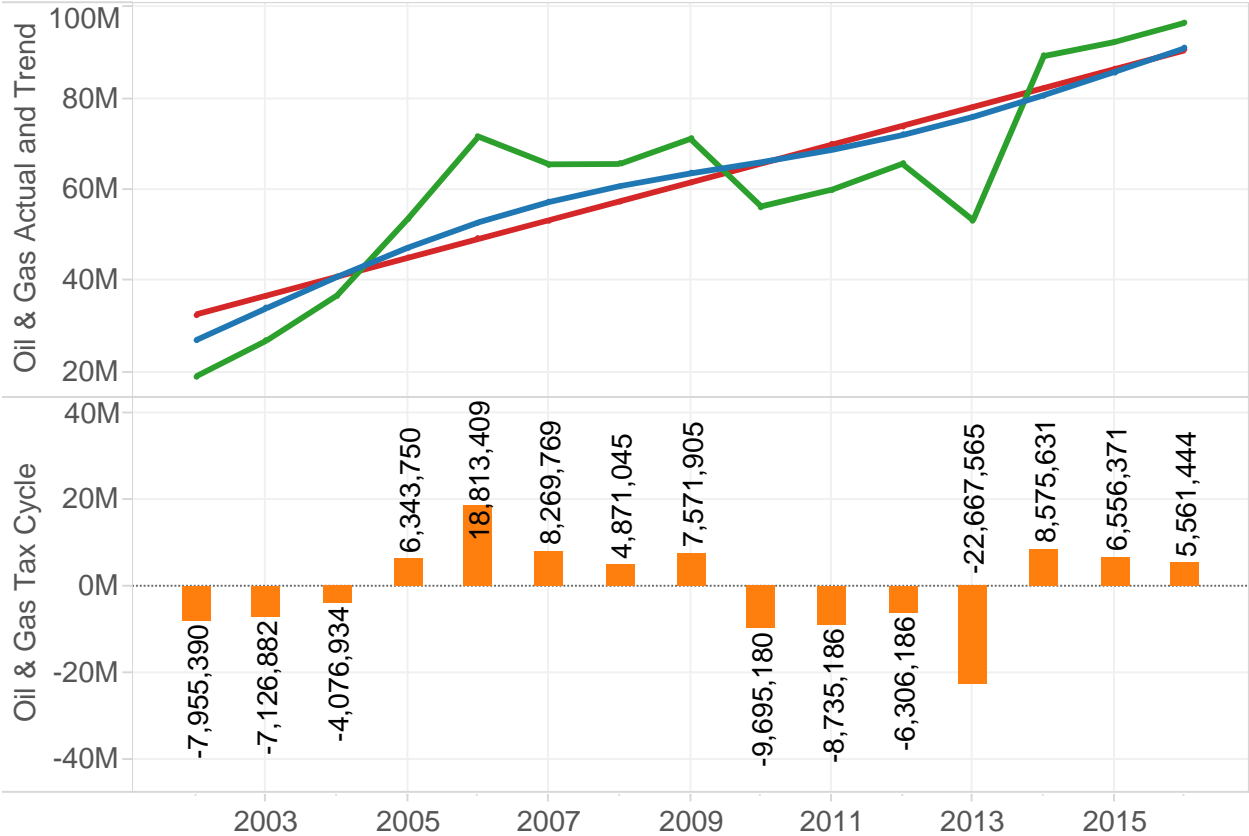


Measure Names

- Beer Cigarette Tobacco Tax
- Beer Cigarette Tobacco Tax Trend
- Beer Cigarette Tobacco Tax Cycle
- Beer Cigarette Tobacco Tax Linear Trend

Figure 20 - Oil and Gas Tax Trend

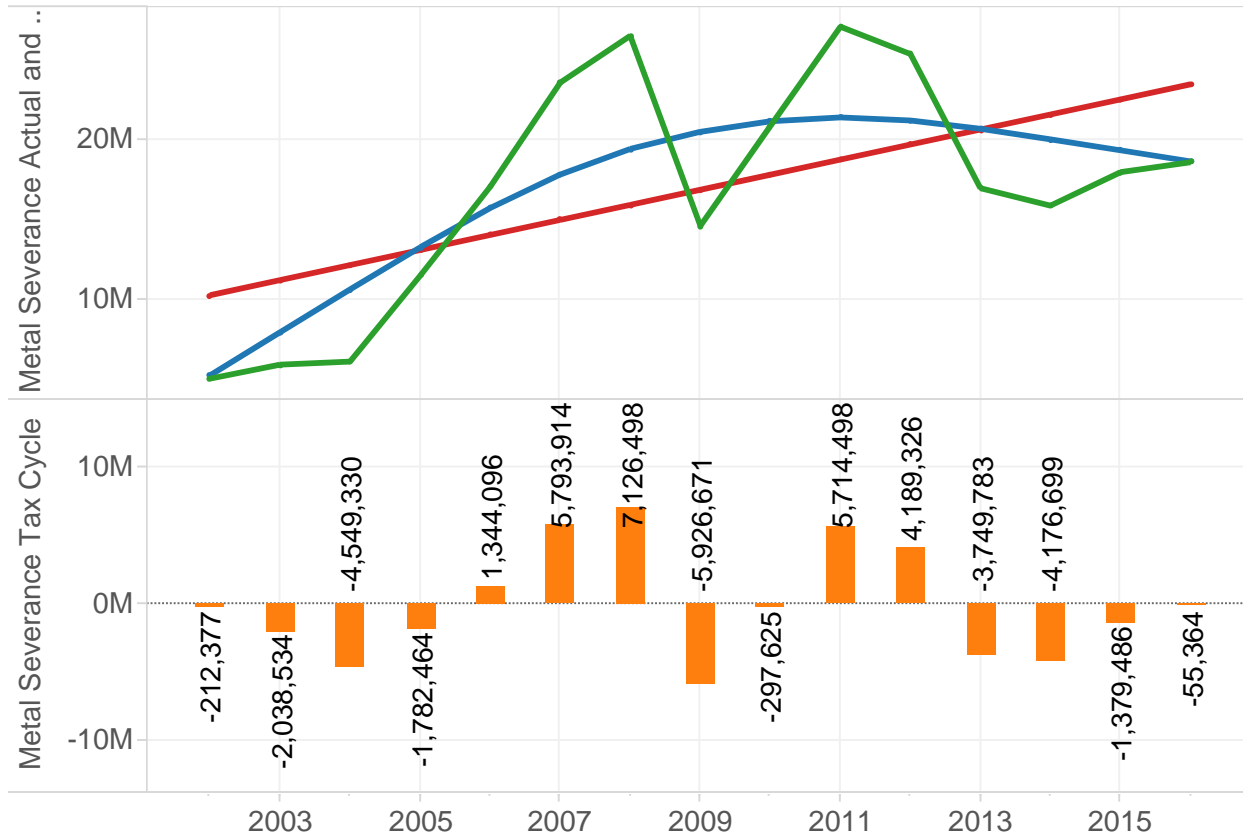
Oil and Gas Severance Tax



- Measure Names**
- Oil Gas Tax Trend
 - Oil Gas Tax Cycle
 - Oil Gas Tax
 - Oil Gas Tax Linear Trend

Figure 21 – Metal Severance Tax Trend

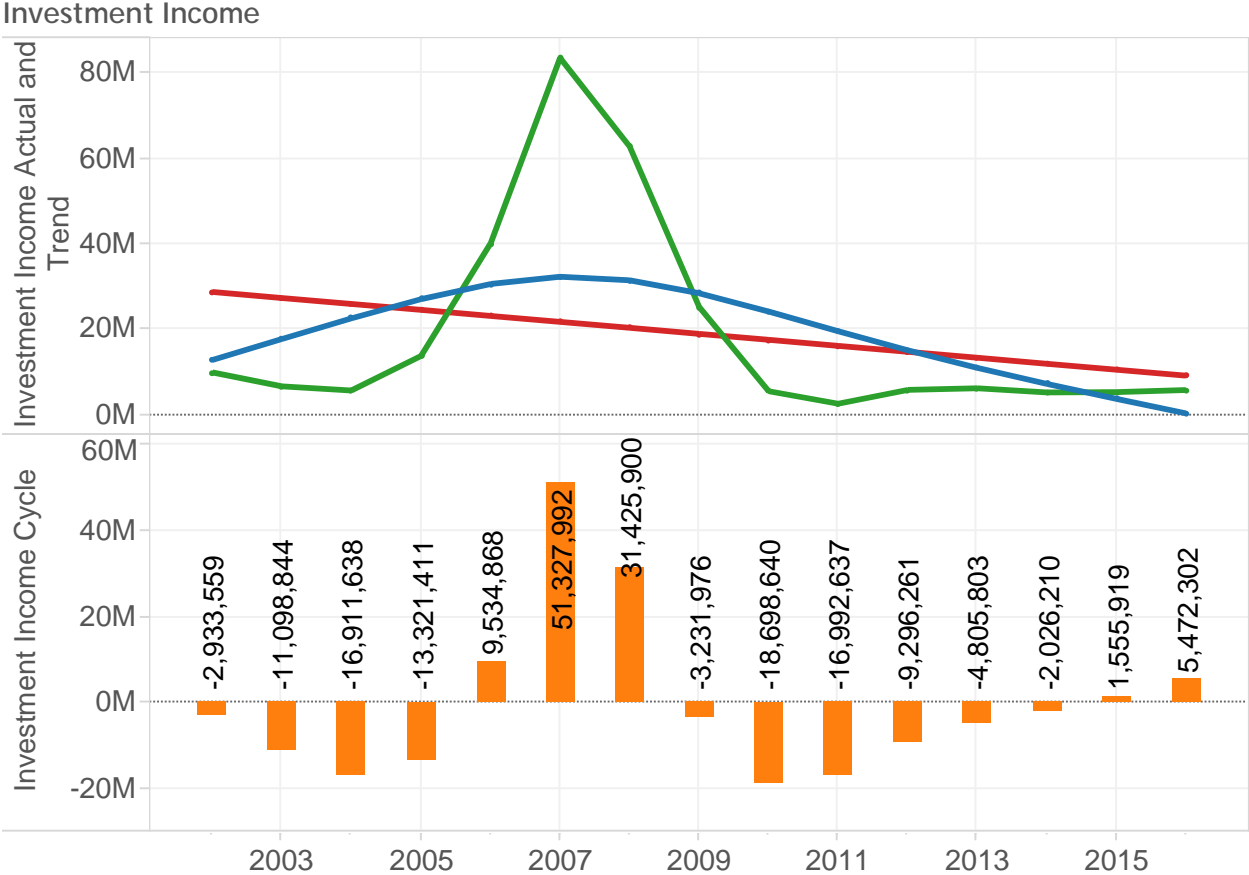
Metal Severance Tax



Measure Names

- Metal Severance Tax
- Metal Severance Tax Trend
- Metal Severance Tax Cycle
- Metal Severance Tax Linear Trend

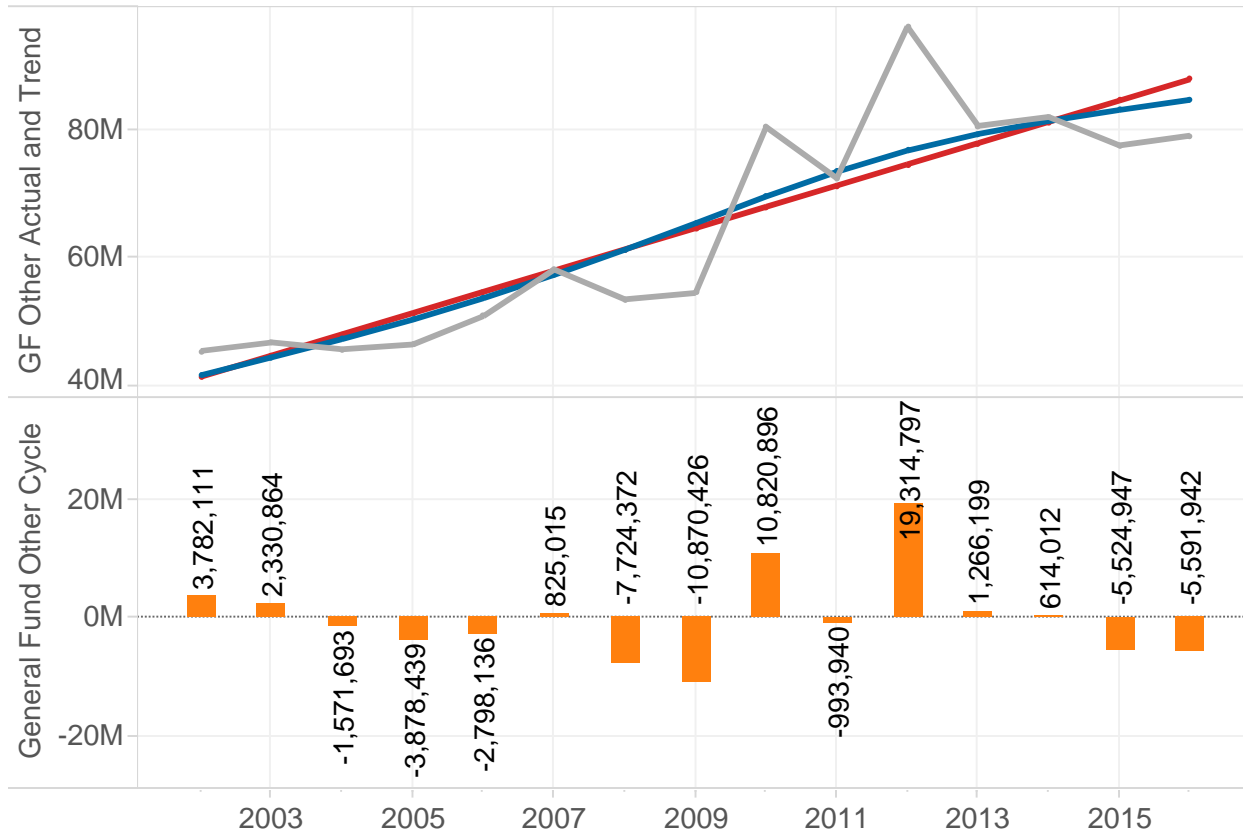
Figure 22 - Investment Income Trend



- Measure Names**
- Investment Income Trend
 - Investment Income Cycle
 - Investment Income
 - Investment Income Linear Trend

Figure 23 - General Fund Other Trend

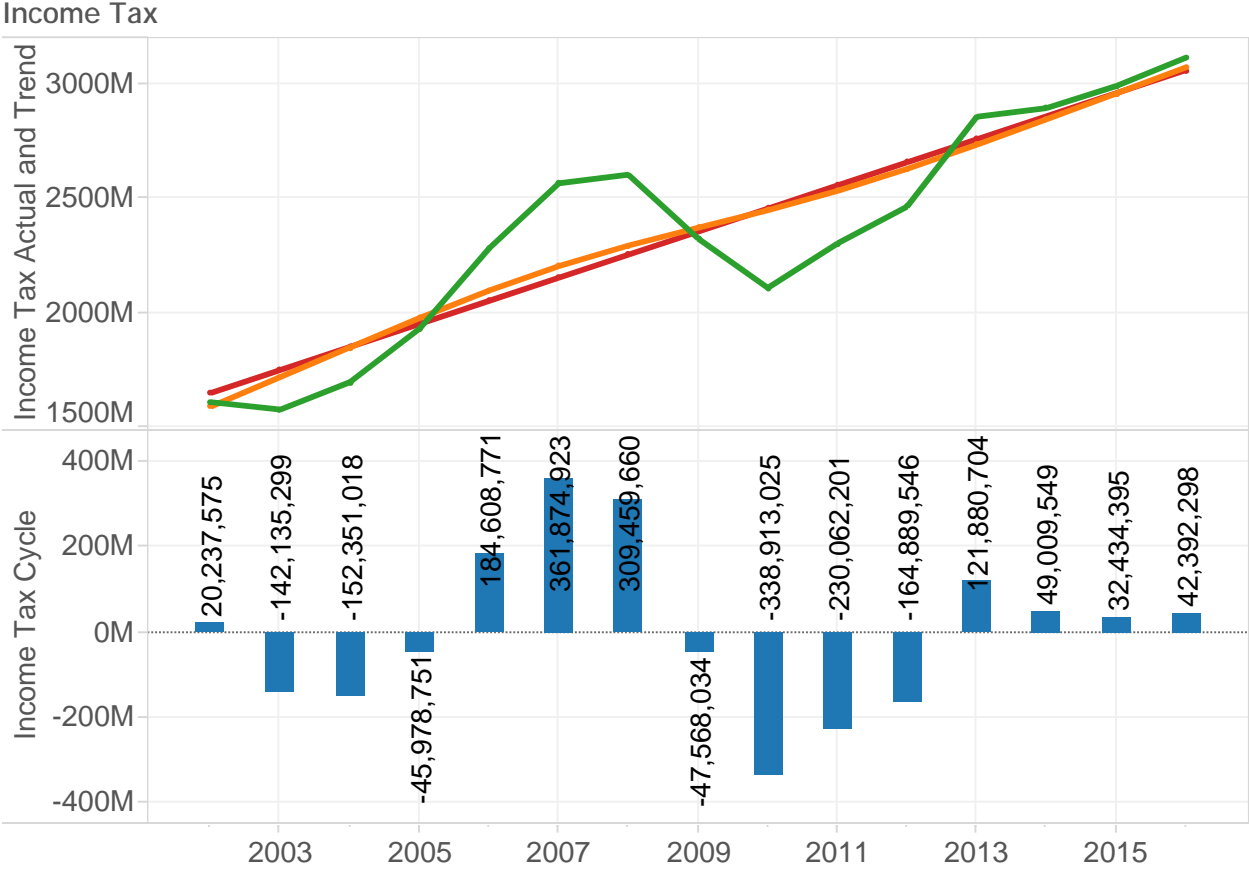
General Fund Other



Measure Names

- General Fund Other
- General Fund Other Trend
- General Fund Other Cycle
- General Fund Other Linear Trend

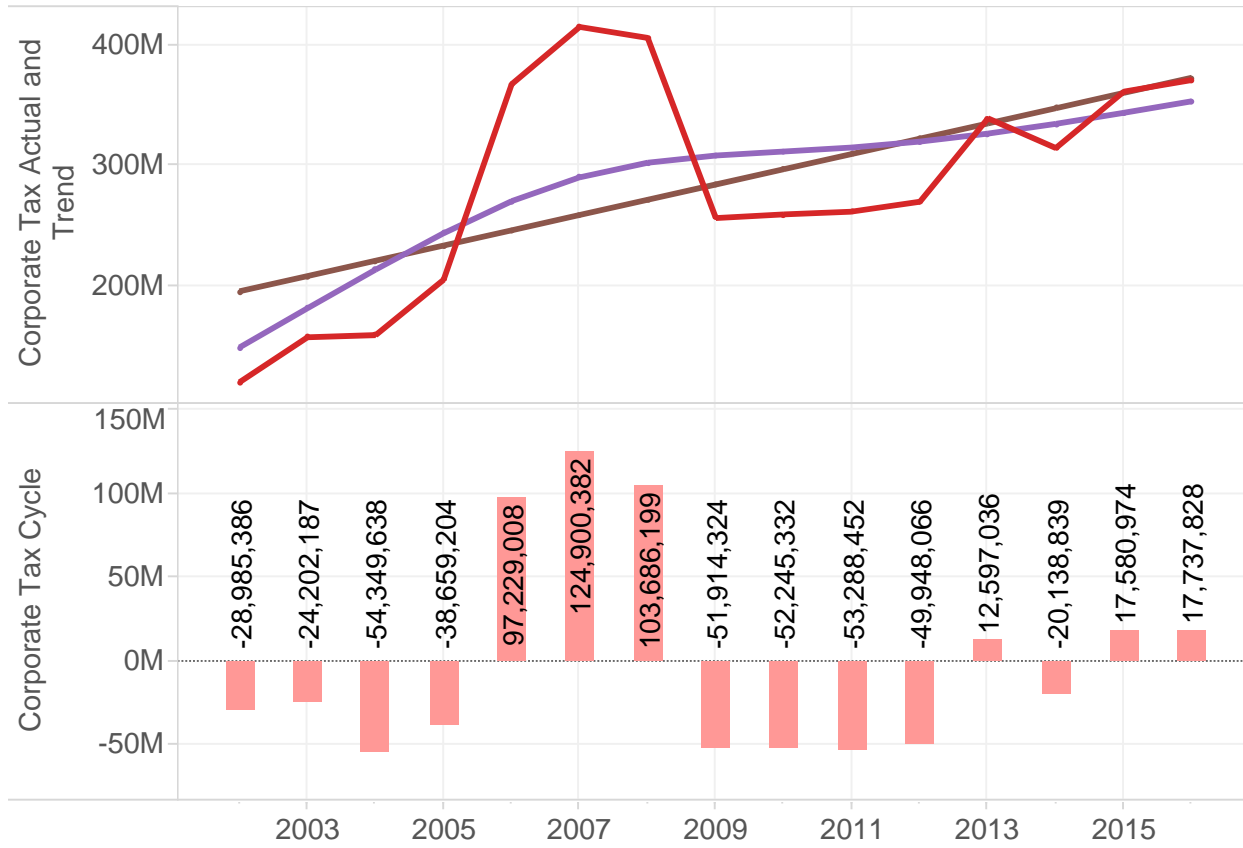
Figure 24 - Income Tax Trend



- Measure Names**
- Income Tax
 - Income Tax Trend
 - Income Tax Cycle
 - Income Tax Linear Trend

Figure 25 - Corporate Tax Trend

Corporate Tax

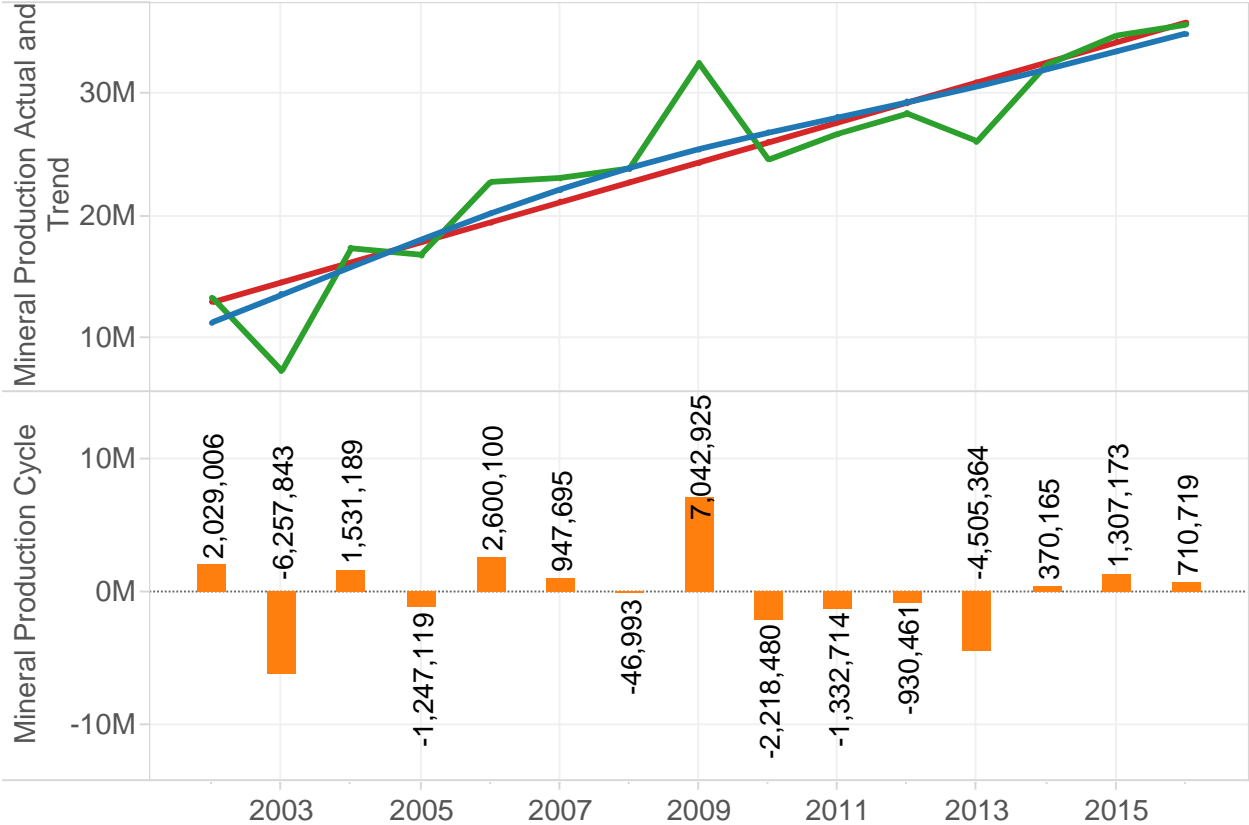


Measure Names

- Corporate Tax
- Corporate Tax Trend
- Corporate Tax Cycle
- Corporate Tax Linear Trend

Figure 26 - Mineral Production Tax Trend

Mineral Production Withholding

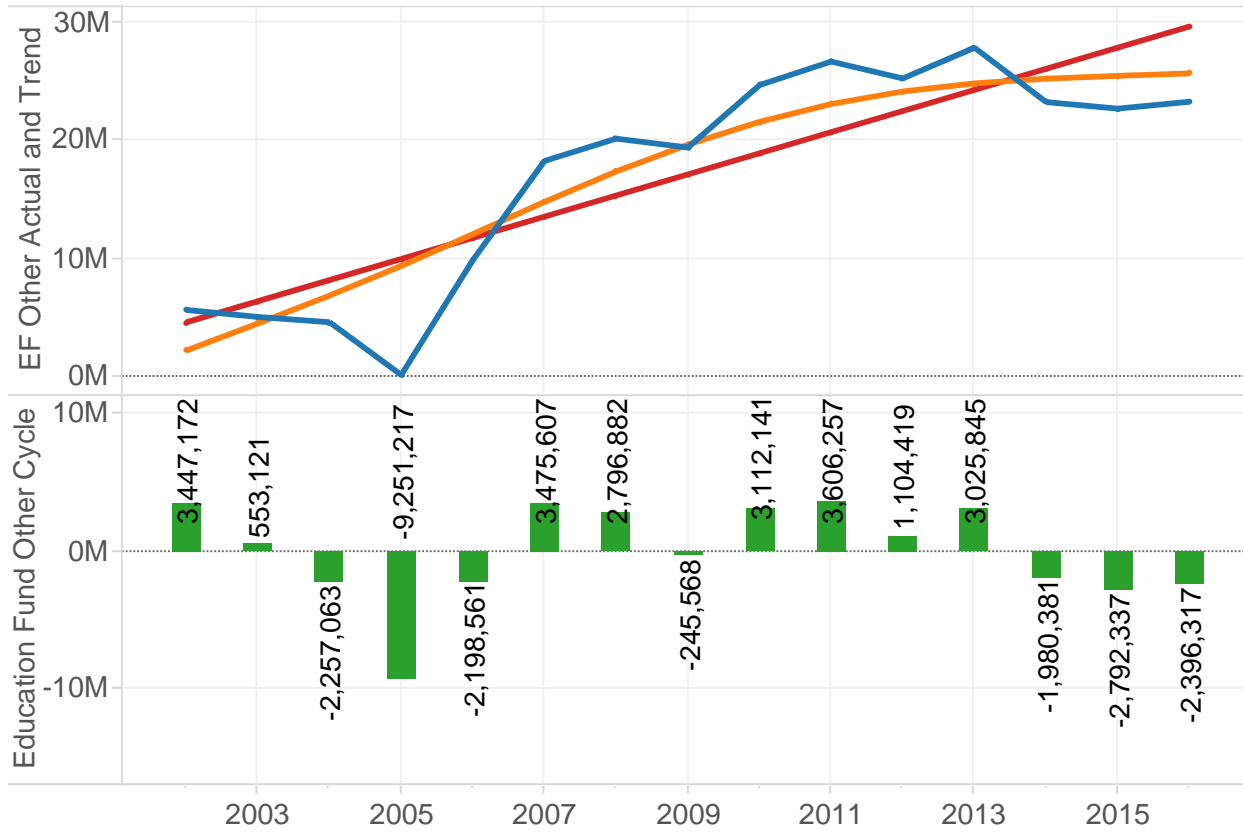


Measure Names

- Mineral Production Trend
- Mineral Production Cycle
- Mineral Production Withholding
- Mineral Production Linear Trend

Figure 27 – Education Fund Other Trend

Education Fund Other



Measure Names

- Education Fund Other
- Education Fund Other Trend
- Education Fund Other Cycle
- Education Fund Other Linear Trend

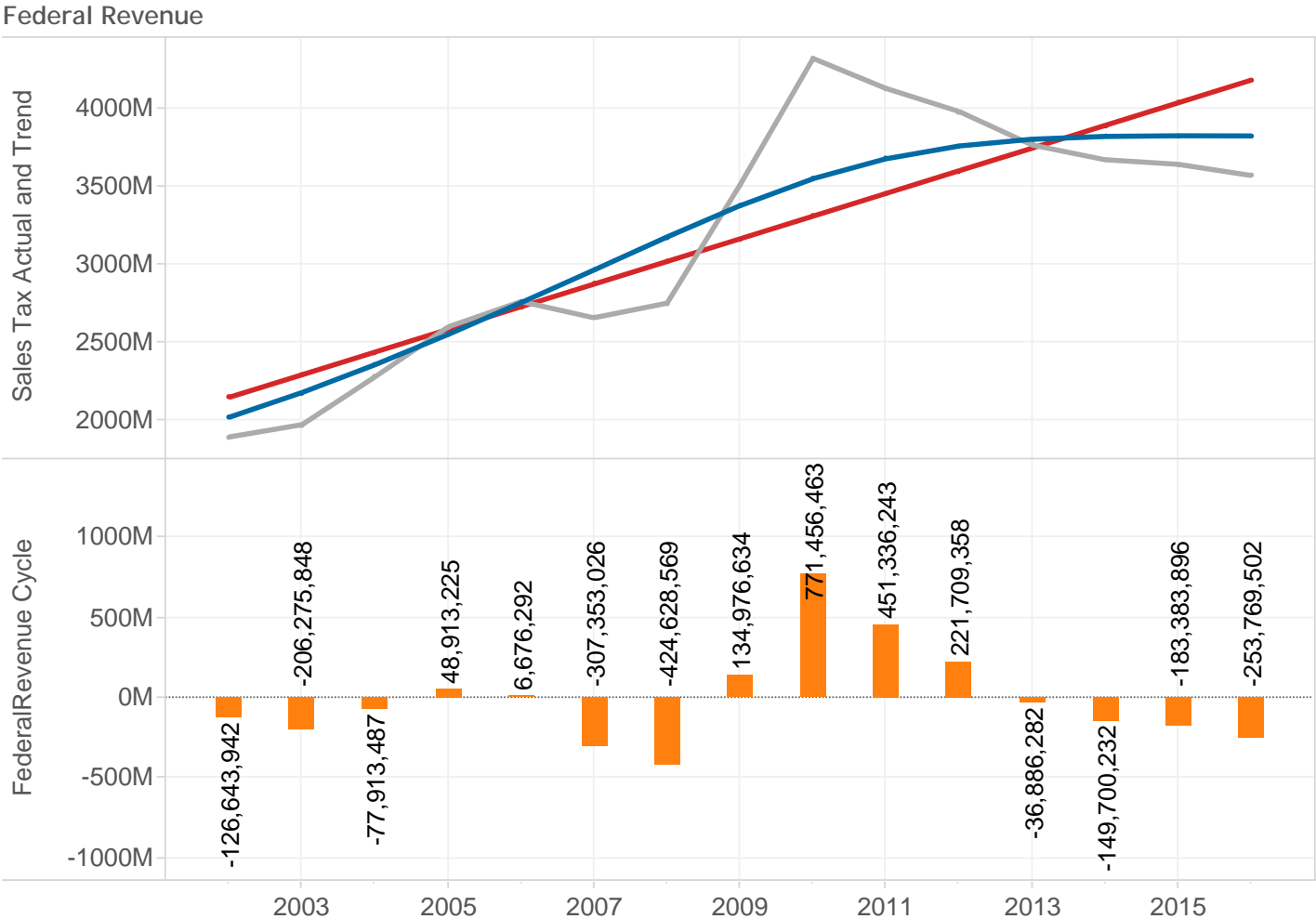
FEDERAL REVENUE RISK

For the first time since passage of this year our report also includes an analysis of federal funds and the liability thereof. The following Figure 28 represents the business cycle of federal revenue. As with the other charts, the blue line represents the trend component, and the red line represents a linear component of that trend. The gray line represents actual federal funds. The bottom orange bars represent the cycle component of revenue.

When compared with the fifteen year trend, our estimate for federal funds is well below both the linear and trend-and-cycle lines. This is largely due to the effects on trend of large federal stimulus payments made under the American Recovery and Reinvestment Act and Education Jobs initiative between 2009 and 2012.

The forecast error associated with Federal Funds over the next 18 months is 10%, or about \$358 million. Legislators could consider hedging against this error by depositing more in reserves. However, covering all the estimating error would require that General Rainy Day Fund transfer rules more than double.

Figure 28 – Federal Revenue Business Cycle



Note: On-book Federal Revenue

- Measure Names**
- Federal Revenue Trend
 - Federal Revenue
 - Federal Revenue Cycle
 - Federal Revenue Linear Trend

OPTIONS FOR PROSPECTIVE DEPOSIT MECHANISMS LINKED TO REVENUE VOLATILITY

Utah makes deposits to rainy day funds retrospectively - after surpluses have been collected. Several other options exist for automatic deposits to the rainy day funds - some of which are prospective. An analysis done by the Pew Charitable Trusts details how three other states determine rainy day fund deposits. We've summarized those mechanisms here.

Virginia: The Commonwealth of Virginia measures a year’s revenue growth against the average of the previous six years. If growth in the current year’s certified tax collections are above the six-year average, one half of the difference is deposited into Virginia’s rainy day funds.

Idaho: Policymakers in Boise compare annual collections to the prior fiscal year. If the difference exceeds 4%, Idaho deposits the amount above 4% into its rainy day funds. Deposits cannot exceed 1% of General Fund collections.

Tennessee: The Governor of the State of Tennessee includes in the budget a rainy day deposit equal to 10% of year-over-year revenue growth. That deposit continues until the fund reaches 5% of revenue allotted to the General Fund and education trust.

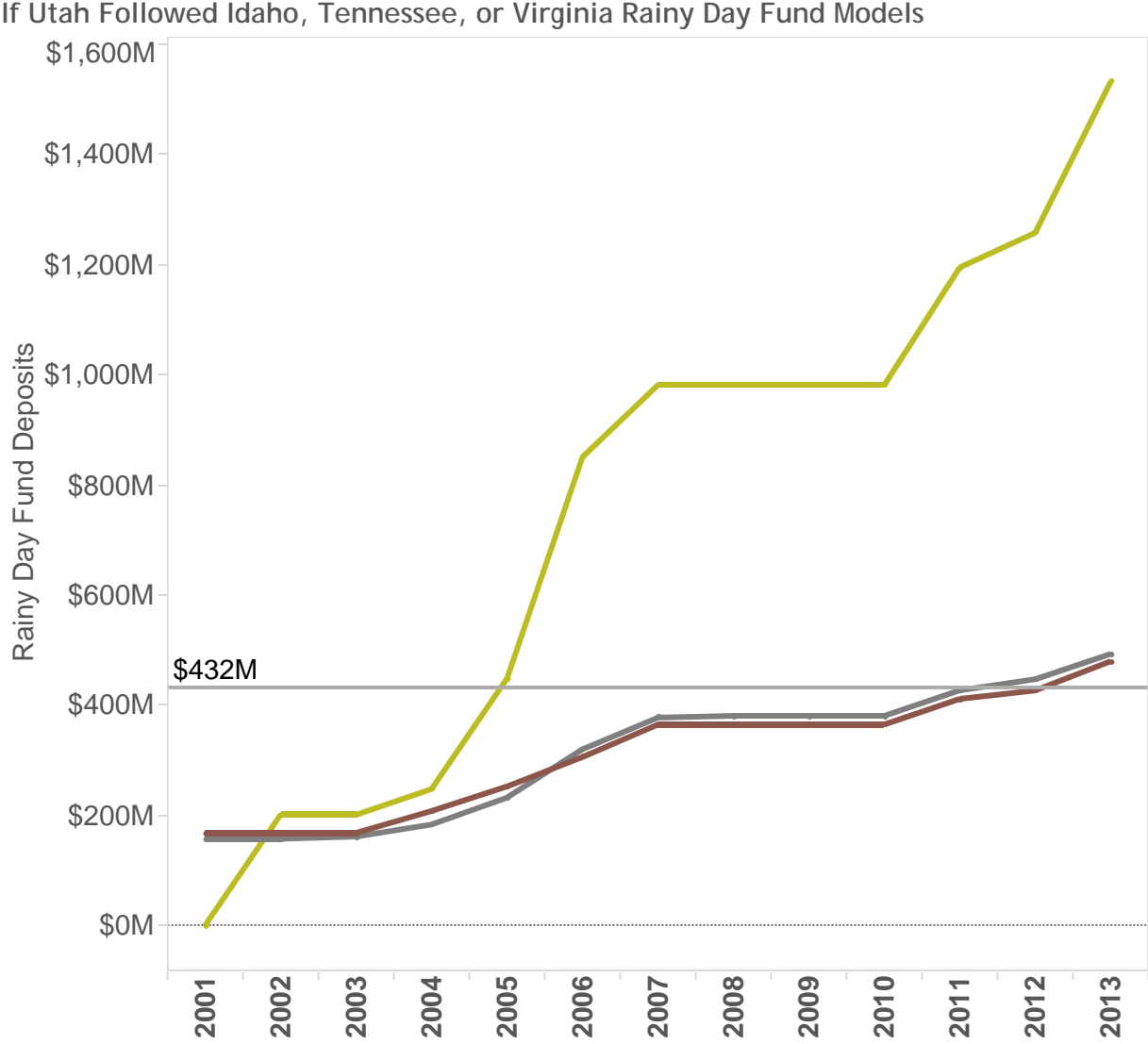
See the attachment to this report for more detail from Pew on how these mechanisms operate, their strengths and weaknesses, and other potential policy considerations.

To demonstrate how these mechanisms might operate in Utah, we’ve applied them to Utah’s revenue collections since 2001. Table 3 and Figure 28 compare hypothetical Utah rainy day fund balances using Virginia, Idaho, and Tennessee deposit rules. In all cases, balances in Utah's rainy day funds would have been higher had Utah used these other deposit mechanisms.

Table 3 – Utah Rainy Day Fund Balances if Following Other States’ Rules

State	Calculated Balance with Utah Figures
Virginia	\$1,612,179,798
Idaho	\$479,682,992
Tennessee	\$503,067,412
Utah currently	\$431,630,000

Figure 29 – Rainy Day Fund Balances if Utah Followed Idaho, Tennessee, or Virginia



Source: Pew Center on the State, LFA

Measure Names

- Idaho
- Tennessee
- Virginia

Utah's current policy limits rainy day fund deposits to various proportions of surplus - 25% of surplus if all previous withdrawals are repaid, up to 50% of surplus otherwise. To be more proactive, Utah might consider applying these same proportions to projected revenue, especially if the projection is above trend and likely due to volatility. As discussed in the previous section of this report, we believe about \$116 million of the current General and Education Fund estimate is above trend.

If the State were to use existing tiers to deposit some of this \$116 million into rainy day funds, it would add \$52 million to rainy day fund balances and still have \$64 million in above-trend revenue. Deposit amounts would be as follows:

1. \$9 million from the General Fund - equal to 25% of the FY 2014 General Fund revenue surplus - to repay a portion of the outstanding \$85 million in previous withdrawals;

2. \$11 million from the Education Fund - the difference between 25% of the FY 2014 Education Fund revenue surplus and what was deposited into the Education Fund Budget Reserve Account; and
3. \$32 million from the Education Fund - equal to 25% of the FY 2014 Education Fund revenue surplus - to repay a portion of the outstanding \$48 million in previous withdrawals.

Recommendation: The Analyst recommends legislators use existing deposit rules to appropriate into rainy day funds some or all of above-trend revenue. The amount to be deposited would be:

1. An amount sufficient to reach 25% of the prior-year's revenue surplus, if that amount was not deposited due to existing transfer limits;
2. The least amount of:
 - a. An additional 25% of the prior-year's revenue surplus;
 - b. The amount of unrepaid previous rainy day fund withdrawals;
 - c. The amount of revenue above trend.

To insulate against risk that estimates might not materialize, we recommend legislators assign the amount to a "holding" line item in the budget, to be deposited in the rainy day funds by the Division of Finance only if at year end revenue collections meet or exceed estimates.

CONCLUSION

When the 8% and 9% thresholds were set in 2011, anticipated revenue volatility was lower than it is today. Based upon recently observed forecasting errors, probability of a recession, and measures of volatility, the 8%/9% caps would cover about 85% of any potential forecast error. To cover 100% of 18-month revenue forecast error, we recommend increasing the statutory transfer thresholds to 9% for the General Budget Reserve Account and 11% for the Education Fund Budget Reserve Account.

Comparing current consensus revenue estimates to 15-year revenue trends by tax type, we find General and Education Fund estimates combined are \$116 million above trend for FY 2016. Combining this analysis with requirements to report forward-looking deposit rule options, we recommend legislators appropriate to rainy day funds an amount of above trend revenue sufficient to fulfill prior-year transfers or repay previous rainy day fund withdrawals.

Appendix
Above-Trend Revenue Growth and Rainy Day Fund Deposit Rules
(Pew Charitable Trusts)

Above-Trend Revenue Growth and Rainy Day Fund Deposit Rules

This research memo is in response to a request we received from the Office of the Legislative Fiscal Analyst (LFA) in late 2013 to review the practices used in other states to estimate above trend revenue growth. Our State Budget Policy research has examined state policies governing rainy day funds, with particular attention to mechanisms that connect rainy day fund deposits to revenue trends. Drawing from that research, this memo presents our analysis of four state approaches to managing revenue volatility with deposit mechanisms that consider growth for your consideration.

We present four state policies for your consideration, and have modeled three of these approaches using Census government finance data and Utah's current tax and fund structure to show how Utah's two major reserve fund balances would have performed had these types of deposit mechanisms been in place over the past 20 years. For each state practice we describe the deposit mechanism in each state's current law, apply the approach to Utah's tax revenue data from Census, and present a scenario of how Utah's fund balances would have grown under each scenario. We then provide an analysis of the strengths and weaknesses of each deposit mechanism as well as recommendations for how each policy could be improved.

VIRGINIA

Virginia's Revenue Stabilization Fund receives mandatory deposits when revenues are above trend, though state leaders can also make additional discretionary deposits to the fund. The fund was developed to account for recurring and nonrecurring revenues. Each year, Virginia makes mandatory deposits based on growth in certified General Fund tax revenues—which include corporate income, personal income, and sales taxes. The Commonwealth takes the difference between the annual percentage increase in the certified tax revenues for the most recently ended fiscal year and the average annual percentage increase in the certified tax revenues (collected in the previous six fiscal years). Then, 50 percent of the above average revenue is set aside. As a formula:

$$\text{Deposit} \geq 0.5 \times [(\text{certified tax revenues}) \times (\text{fiscal year's \% increase} - \text{average increase over six years})]$$

In practice, if there was an average of 4 percent over the past 6 years, and revenues from those three taxes (CIT, PIT, and Sales) came in at 6 percent higher than the previous year, half of that difference ($0.5 \times 2\% = 1\%$ of certified taxes) gets deposited into the fund. In addition, discretionary deposits may be made by appropriation at any time as long as they do not push the fund above its maximum size.

Virginia's Revenue Stabilization Fund was created through an amendment to the Virginia Constitution in 1992 after a study was conducted by Virginia's Joint Legislative Audit and Review Commission (JLARC). The study findings were presented to the Subcommittee on the

Executive Budget Process.ⁱ The Revenue Stabilization Fund is “intended to offer a financial cushion in the event of an unexpected downturn in the economy.”ⁱⁱ

The intent of the formula was to allow for the maximum fund size to grow over the years to keep pace with inflation and the state’s economic growth. It is based on the subcommittee’s belief that “it is fiscally prudent for the state to promote the accumulation of a revenue reserve during times of above-average growth in the tax base and revenue collections, since such growth is unsustainable over the long term”ⁱⁱⁱ By depositing a fifty percent portion of above-average revenue growth into the fund, the intention was to avoid extraordinary increases in state revenues becoming an automatic part of the state’s expenditure base; therefore, preventing the state from becoming overly dependent on revenue growth that is one-time, unexpected, and/or unsustainable over the long term.

STRENGTHS

- The six-year moving average approach provides a reasonable proxy for revenue volatility over the course of an economic cycle.
- The deposits are a mandatory part of Virginia’s budgetary process.
- Historically, Virginia has had a well-funded rainy day fund compared to other states. Prior to the recession, in 2006, Virginia had \$2.4 billion in reserve funds, which alone would have funded their operations for 58.5 days. The 50-state median at that same time was 43.1 days.

WEAKNESSES

- The policy is structured with a 2-year time lag which means that in some years with strong revenue growth, deposits are not made. Conversely, as revenue growth begins to slow, deposits continue. In FY 2005 and FY 2006 annual revenue growth exceeded 10 percent, but the Virginia policy does not generate a required deposit in those years. In FY 2008 and FY 2009, as revenue slows and the declines, deposits are required.
- Recent history shows that a period of significant revenue decline, such as FY 2009 and FY 2010, can lead to large deposits as revenue recovers.
- The six-year moving average could yield unusual results during atypical business cycles.

POTENTIAL POLICY IMPROVEMENTS

- The timing of the deposits can be adjusted by using estimated instead of actual data to determine the amount of the rainy day fund deposit. For example, a regular deposit could be budgeted based on comparing estimated revenue growth for the current year to the six-year trend. The difference in growth rates could then be applied to actual revenue from the prior year.
- Among the policies analyzed, the Virginia policy generated the largest rainy day fund deposits. To address the size of deposits, a maximum annual deposit threshold could be included in the policy.
- The number of years included in the moving average could be assessed based on Utah’s own historical experience and periodically re-examined and adjusted.

To consider: is a six-year moving average the appropriate number years for Utah? Virginia allocates 50 percent of the above trend-line determination to the state's rainy day fund, if Utah policymakers are interested in establishing a rainy day fund deposit rule, what percentage of above-trend growth would be appropriate?

Figure 1. Virginia Model Growth Trend Calculation
Based on Utah General Fund Revenues

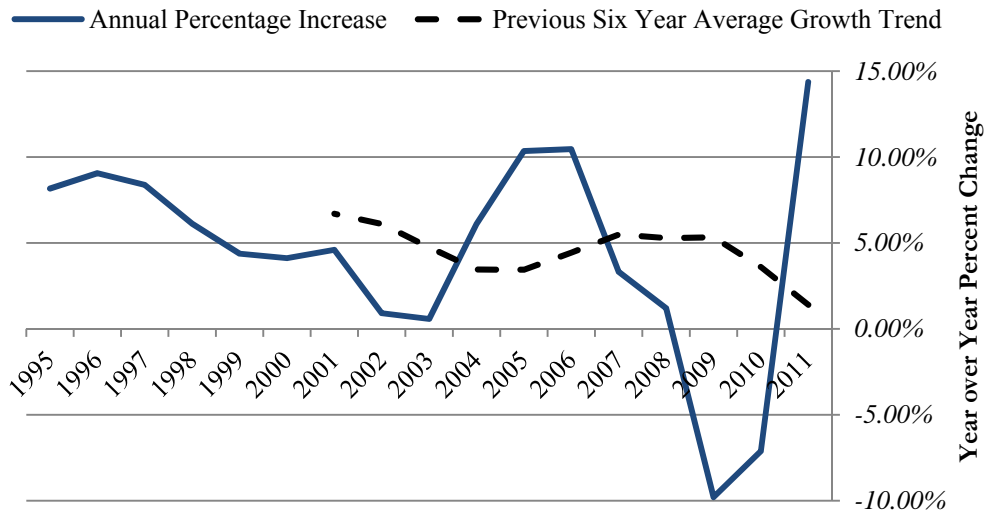
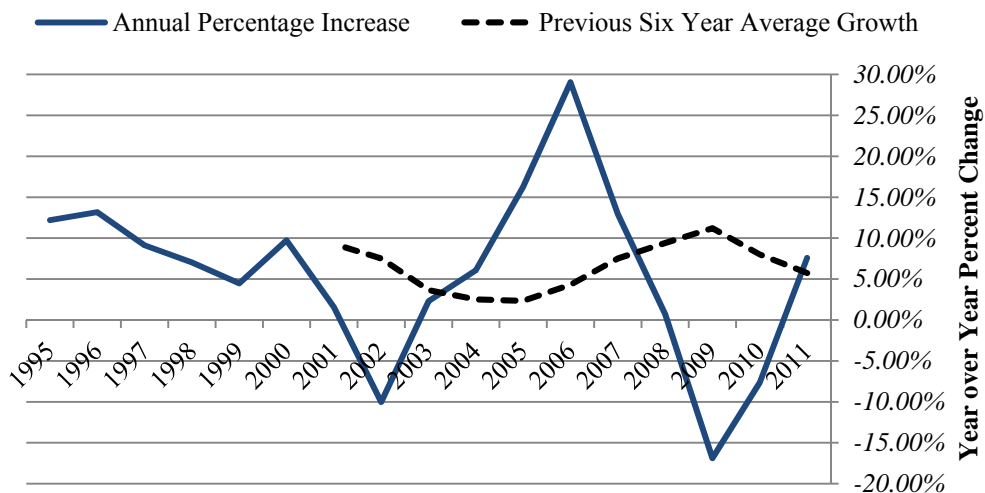


Figure 2. Virginia Model Growth Trend Calculation
Based on Utah Education Fund Revenues



In Idaho, at the end of each fiscal year the state deposits funds from the general fund to their Budget Stabilization Fund if the state controller certifies that the receipts to the general fund exceed receipts from the previous fiscal year by more than 4 percent. If so, the controller transfers all general fund collections *in excess* of 4 percent *up to a maximum* of 1 percent of general fund collections.^{iv}

STRENGTHS

- This rule is fairly simple to understand and explain.
- In recent years, Idaho has had a well-funded rainy day fund compared to other states. Prior to the recession in 2006, Idaho had \$411 million in reserve funds, which alone would have funded their operations for 67.6 days. The 50-state median at that same time was 43.1 days.

WEAKNESSES

- This rule arbitrarily limits the deposit amount to one percent of revenue per year, even in years of unusually high growth. For example, a year with ten percent growth results in the same deposit (on a percentage basis), as a year with five percent growth.
- There is no empirical rationale for the four percent growth threshold or the one-percent annual cap on deposits, nor is there a mechanism in the law for re-visiting those parameters periodically.

POTENTIAL POLICY IMPROVEMENTS

- If the threshold growth rate was calculated based on historical trends and revisited on regular basis, this approach would better connect rainy day fund deposits to volatility.

To consider: what methodology should Utah use to develop a threshold growth rate that triggers a rainy day fund deposit? Should that growth rate be revisited and revised over time? Idaho allocates one percent of revenue to its rainy day fund when revenue growth exceeds four percent—what percentage of revenue would be appropriate in Utah?

Figure 3. Idaho Model Growth Trend Calculation
Based on Utah General Fund Revenues

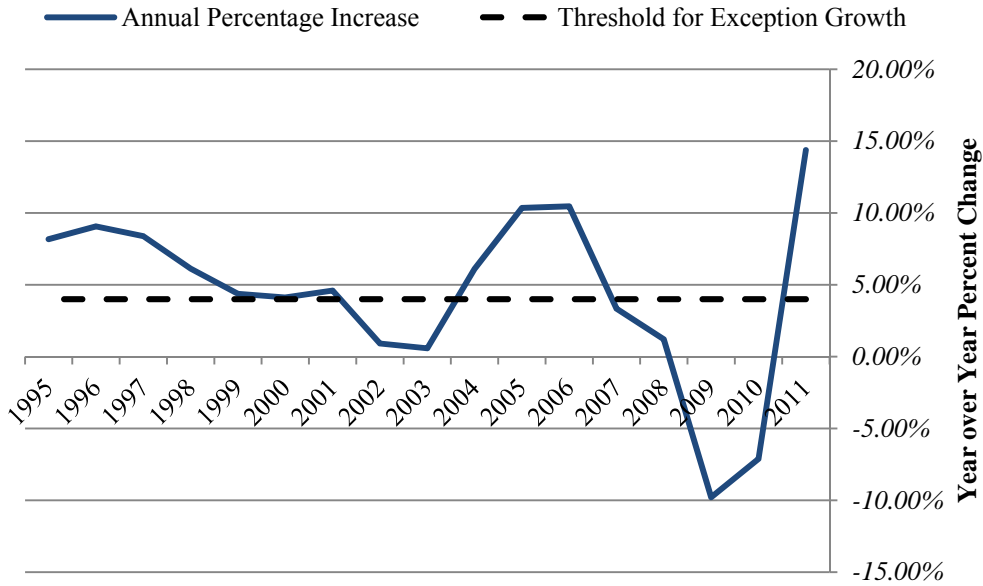
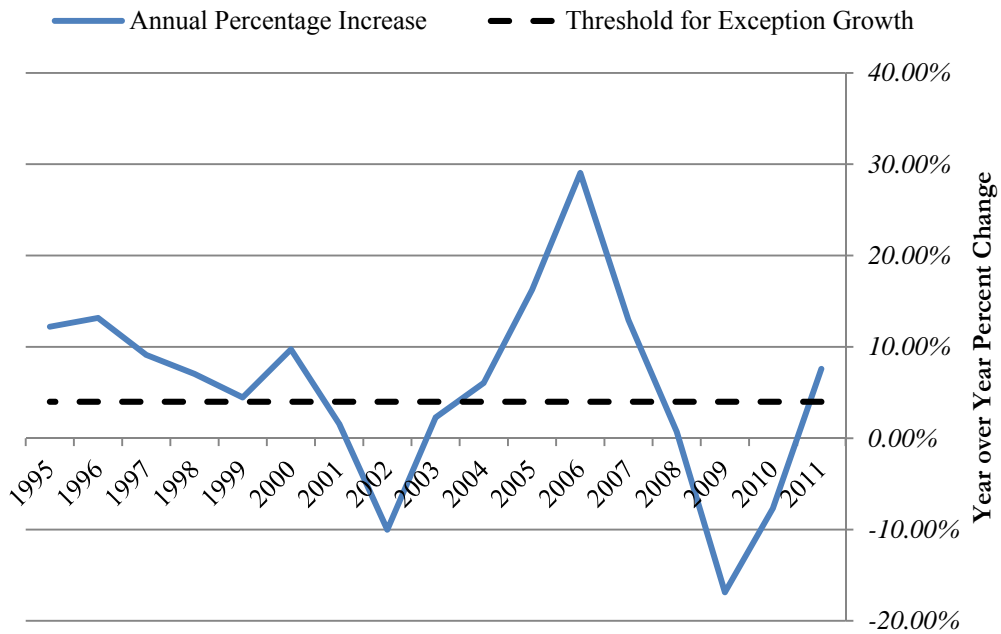


Figure 4. Idaho Model Growth Trend Calculation
Based on Utah Education Fund Revenues



TENNESSEE

In Tennessee the governor includes the amount to be allocated to the state’s Reserve for Revenue Fluctuations, the state’s rainy day fund, in the annual budget document and general appropriations bill. The deposit is equal to 10 percent of the estimated growth in the state tax revenue allocated to the general fund and the education trust fund. This process continues yearly until the amount in reserves reaches 5 percent of the state tax revenue allocated.

STRENGTHS

- There is no timing lag between the estimated amount of the deposit and the transfer of funds.
- Prior to the recession in 2007, Tennessee had \$1.6 billion in reserve funds, which alone would have funded their operations for 57.9 days. The 50-state median at that same time was 43.3 days.

WEAKNESSES

- The Tennessee rule requires a rainy day fund deposit in any year that there is revenue growth, even periods of slow growth.
- Conversely, in years of rapid growth, the state takes a relatively small share off the table compared to other rules—in a year where revenues grow by 10 percent, for example, only 1 percent of revenues are transferred and the other 9 percent can be used for recurring purposes.
- In effect, the threshold for “exceptional” growth is zero, where any revenue growth at all is considered above-trend.

POTENTIAL POLICY IMPROVEMENTS

- Conduct an analysis to determine the appropriate percentage of revenue growth to set aside each year.
- Establish a threshold growth rate required for deposits to occur, so that deposits are not required in periods of slow revenue growth.

To consider: Tennessee allocates 10 percent of annual growth to its rainy day fund. Is 10 percent the appropriate percentage in Utah? Is there a threshold revenue growth that would trigger a rainy day fund deposit (not part of Tennessee law)?

Figure 5. Tennessee Model Growth Trend Calculation
Based on Utah General Fund Revenues

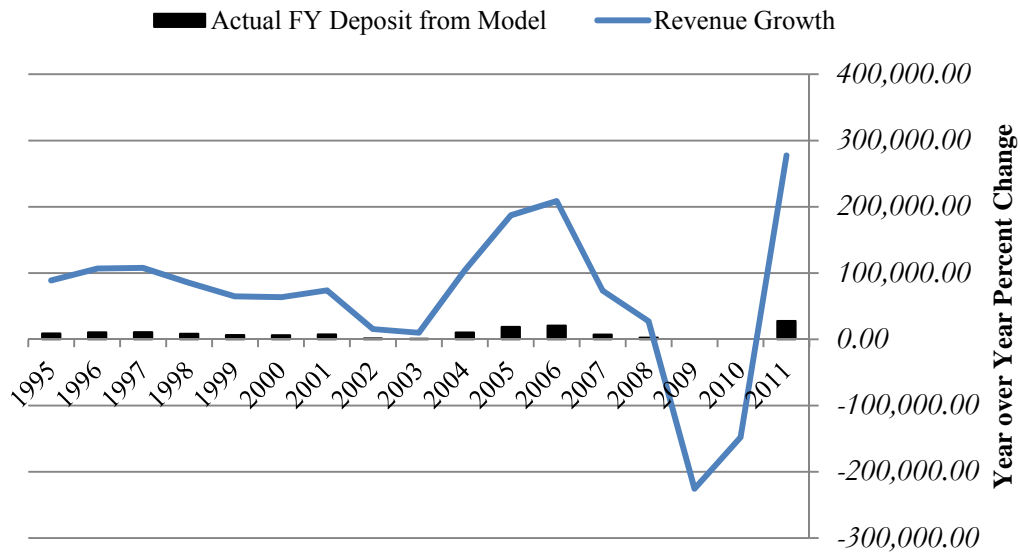
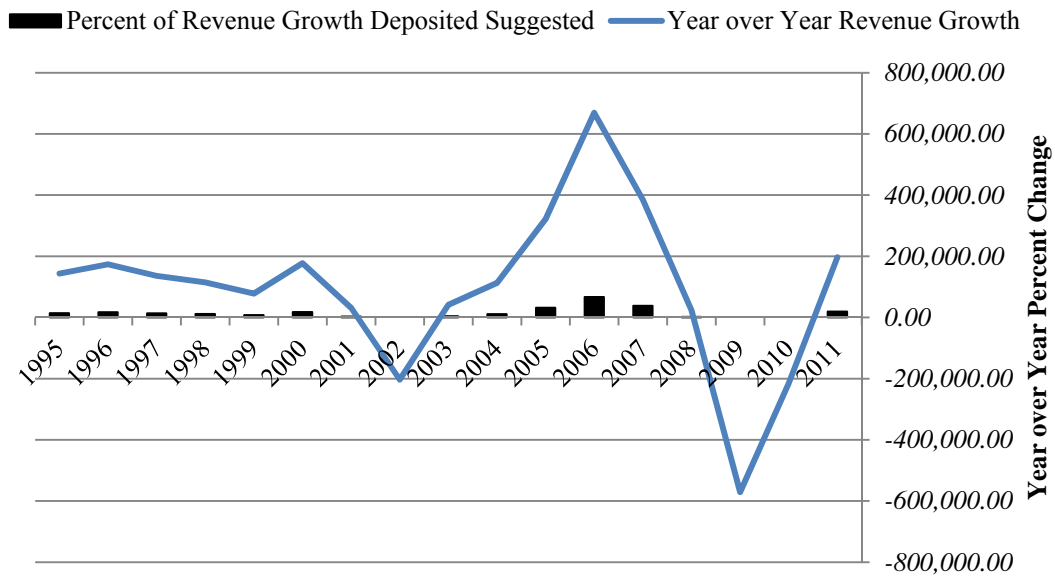


Figure 6. Tennessee Model Growth Trend Calculation
Based on Utah Education Fund Revenues



MASSACHUSETTS

Massachusetts's Commonwealth Stabilization Fund has three main sources of fund deposits: 1) any amounts left as net surplus in budgeted funds at end of fiscal year, 2) inflows from deposits of judgments and settlements in excess of \$10 million, and 3) unusually high capital gains tax collections. The two latter components were added in 2010. While the state has a long history of supporting their rainy day fund, these new provisions helped rebuild balances quickly after the downturn.^v

The rule for depositing capital gains tax revenues may be of particular interest for Utah policymakers interested in identifying above trend revenue growth. Unlike the three states outlined above, Massachusetts specifically examines revenues that they have found to be drivers of fluctuations from year to year. After the executive branch studied past volatility in these tax revenues and found them highly cyclical, the state legislature passed a limit on the use of capital gains taxes above \$1 billion in the budget. Anything above this limit is direct to the budget stabilization fund, with a portion passed on to the state retiree benefits trust fund. This determination is made as part of the consensus revenue estimates at the start of the budget year. From year to year, the \$1 billion threshold is revised slightly based on growth in the U.S. gross domestic product.

Our general assessment of this approach is that, for states in which capital gains revenue is a significant and volatile contributor to overall revenue collections, this can be an effective deposit rule. This approach can be applied to other volatile revenue sources, such as corporate income tax or severance taxes. A state-specific analysis of the volatility of these sources would be necessary to set the ideal parameters for this policy.

STRENGTHS

- The choice to set aside capital gains tax and legal settlement revenues was based on an analysis of historical state volatility.
- Deposits are committed to early in the budget process, ensuring that saving is a top priority.
- The threshold for defining above average growth in capital gains tax revenues evolves over time.
- Since being implemented, these policies helped the state bring their rainy day fund balance up to the third highest of any state—in absolute terms—by 2012. The policy was also lauded by credit rating agencies.

WEAKNESSES

- A policy like this may not be a viable option for all states if the tax code does not differentiate between capital gains and other types of income or if they do not have a capital gains tax—or another similarly volatile tax.
- Large swings in other revenue streams, to the extent that they occur, would not be addressed directly under this policy. Large end of year surpluses are set aside, which makes this problem somewhat less acute.

POTENTIAL POLICY IMPROVEMENTS

- Recurring, legislated volatility studies—like the reports prepared in Utah—would track whether the capital gains tax is still a primary source of volatility and identify important trends in other revenue sources.
- Because state economic trends can vary from national ones, using a measure of the state economy may be more appropriate for determining growth in the \$1 billion limit than U.S. GDP.

To consider: which individual revenue sources are the most volatile, and what is an appropriate threshold above which collections from that source would be deposited in the rainy day fund?

Due to data limitations, we were not able to model the Massachusetts policy for Utah. We could model this approach if provided with historical actual revenue data from capital gains, if available. Should there be interest, we can provide scenarios to inform Utah policy design around what a deposit mechanism pinned to a specific volatile tax source could look like, such as the personal income tax or various severance taxes.

ⁱ Report of the Joint Legislative Audit and Revenue Commission on Proposal for a Revenue Stabilization Fund in Virginia, Senate Document No. 24, 1991. <http://jlarc.virginia.gov/reports/Rpt127.pdf>

ⁱⁱ Virginia Division of Legislative Services: DLS Report, Virginia's Revenue Stabilization Fund. Number 1 – July 1999. <http://dls.virginia.gov/pubs/report/report1.htm>

ⁱⁱⁱ Ibid

^{iv} Idaho Code § 57-814. <http://legislature.idaho.gov/idstat/Title57/T57CH8SECT57-814.htm>

^v Mass. Gen. Laws ch. 29, § 5C and § 5G (2013)